# PHILIPS 29PT6021

MODEL

SERVICE MANUAL

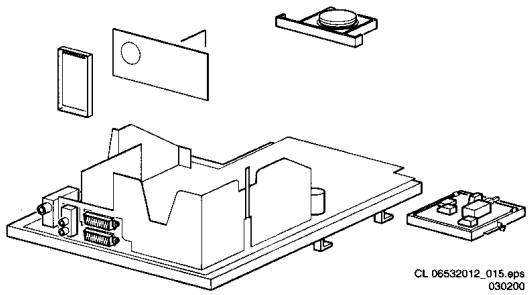
# Colour Television

# Chassis

# A10E

## AA

Service
Service
**Service**



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# Service Manual


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PHILIPS

# 1. Technical specification, connection facilities and chassis overview

## 1.1 Supply

| | | |
|---|---|---|
| Mains Voltage | : | 230 Vac ± 15 % |
| Power Consumption | : | 160 W max. |
| Stand By cosumption (220V) | : | ≤ 3 W |
| Mains Frequency | : | 50 - 60 Hz ( 5 % |
| Tuning System | : | PLL |
| Reception | : | Western Europe - PAL B/G/D/K/I, SECAM B/G/D/K/L/L' |
| | : | Eastern Europe - PAL B/G/D/K, SECAM B/G/D/K |
| Sound System | : | Western Europe - 2CS BG, NICAM I/B/G/D/K/L, |
| | : | Eastern Europe - 2CS, NICAM B/G/D/K |
| Sound Output | : | 2 x 5 W - 24" and 28" |
| | : | 2 x 10 W - 32" |
| Ambient temperature : | : | + 5 oC to +45 °C |
| Frequency ranges - tuner | : | Off air - 45.25 - 855.25 MHz |
| | : | Cable - 69.25 - 463.25 MHz |
| Aerial input | : | Coaxial 75 Ω |
| Synchronization | : | Horizontal Pull-In range ( +200-300Hz ) |
| | : | Vertical pull-in Range ( ± 5 Hz ) |
| Teletext | : | 10 / 100 pages |
| Remote Control | : | Type - RCA10E82B |

## 1.2 Connection Diagram

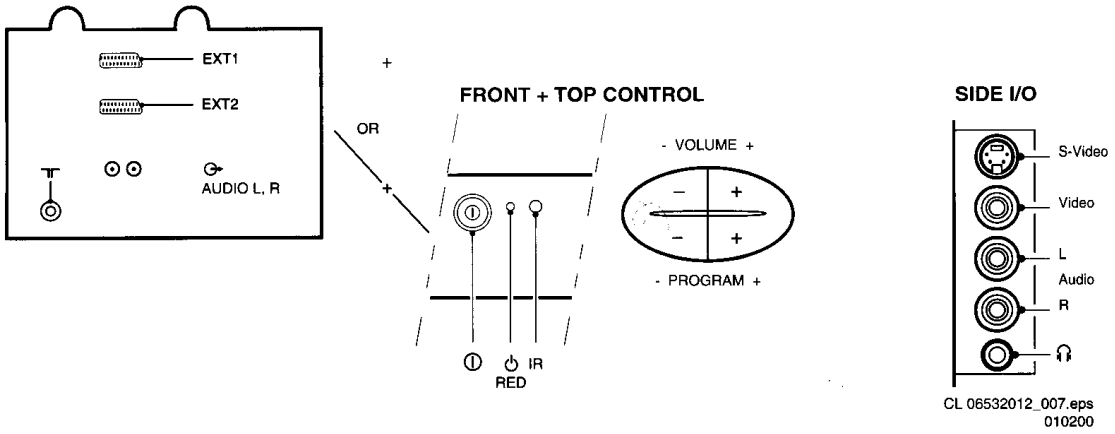



Figure 1-1

### 1.2.1 EXT1: CVBS (in/out) + RGB (in) - Tuner at output

| | | |
|---|---|---|
| 1 - Audio R | (0.5 $V_{RMS}$ / 1 kΩ) | ⊖→ |
| 2 - Audio R | (0.2 - 2 $V_{RMS}$ / 10 kΩ) | ⊖ |
| 3 - Audio L | (0.5 $V_{RMS}$ / 1kΩ) | ⊖→ |
| 4 - Audio | GND | ⏚ |
| 5 - Blue | GND | ⏚ |
| 6 - Audio L | (0.2 - 2 $V_{RMS}$ / 10kΩ) | ⊖ |
| 7 - Blue | (0.7 $V_{PP}$ / 75 Ω) | ⊖ |
| 8 - CVBS status | (0-2V: INT; 4.5-7V: EXT1-16/9; 9.5-12V:EXT1-4/3) | |
| 9 - Green | GND | ⏚ |
| 10- | | |
| 11- Green | (0.7 $V_{PP}$ / 75 Ω) | ⊖ |
| 12- | | |
| 13- Red | GND | ⏚ |
| 14- RGB status | GND | ⏚ |
| 15- Red | (0.7 $V_{PP}$ / 75Ω) | ⊖ |
| 16- RGB status | (0-0.4V: INT;1-3V: EXT1/75Ω) | |
| 17- CVBS | GND | ⏚ |
| 18- CVBS | GND | ⏚ |
| 19- CVBS | (1 $V_{PP}$/75Ω) | ⊖→ |
| 20- CVBS | (1 $V_{PP}$/75Ω) | ⊖ |
| 21- Earth screen | GND | ⏚ |

### 1.2.2 EXT2: CVBS (in/out) + SVHS (in)

Input: EXT2 then output = tuner; input: other then output = input

| | | |
|---|---|---|
| 1 - Audio R | (0.5 $V_{RMS}$ / 1kΩ) | ⊖→ |
| 2 - Audio R | (0.2 - 2 $V_{RMS}$ / 10kΩ) | ⊖ |
| 3 - Audio L | (0.5 $V_{RMS}$ / 1kΩ) | ⊖→ |
| 4 - Audio | GND | ⏚ |
| 5 - | | |
| 6 - Audio L | (0.2 - 2 $V_{RMS}$ / 10kΩ) | ⊖ |
| 7 - | | |
| 8 - CVBS status | (0 - 2 V: INT, 4.5 - 7 V: EXT1 16:9, 9.5 - 12 V: EXT1 4:3) | |
| 9 - | | |
| 10- | | |
| 11- | | |
| 12- | | |
| 13- C | GND | ⏚ |
| 14- | | |
| 15- C | (300 $mV_{PP}$ / 75 Ω) | ⊖ |
| 16- | | |
| 17- CVBS | GND | ⏚ |
| 18- CVBS | GND | ⏚ |
| 19- CVBS | (1 $V_{PP}$ / 75 Ω) | ⊖→ |
| 20- CVBS/Y | (1 $V_{PP}$ / 75 Ω) | ⊖ |
| 21- Earth screen | GND | ⏚ |

### 1.2.3 Cinch - audio out

| | | |
|---|---|---|
| L | - Audio (red) | (0.5 $V_{RMS}$ / 1 kΩ) |
| R | - Audio (white) | (0.5 $V_{RMS}$ / 1 kΩ) |

### 1.2.4 Cinch - audio/video in

| | | |
|---|---|---|
| - | - CVBS (yellow) | (1 V) |
| L | - Audio (red) | (0.2 - 2 $V_{RMS}$ / 10 kΩ) |
| R | - Audio (white) | (0.2 - 2 $V_{RMS}$ / 10 kΩ) |

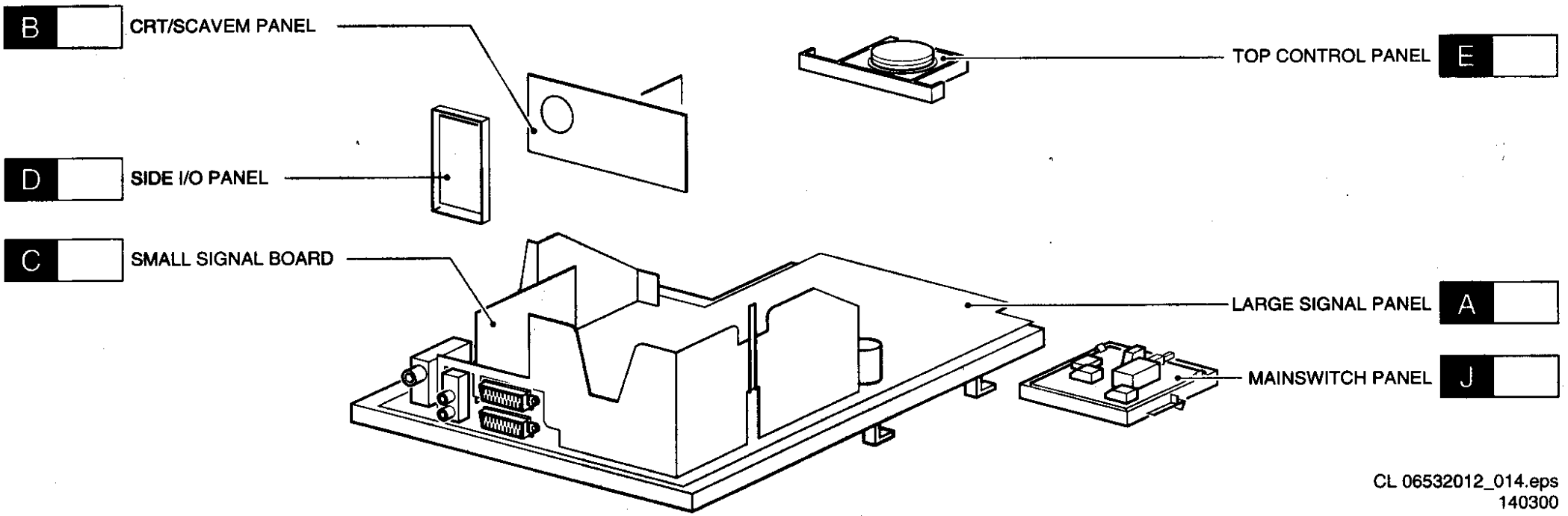
### 1.2.5 Headphone

| | | |
|---|---|---|
| - | - Jack | 32 - 2000 Ω.(10 mW) |

### 1.2.6 SVHS

| | | |
|---|---|---|
| 1 | - | |
| 2 | - | |
| 3 | - Y | (1 $V_{PP}$ / 75 Ω) |
| 4 | - C | (0.3 $V_{PP}$ / 75 Ω) |

## 1.3 PCB location drawing

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# 2. Safety instructions, maintenance instruction, warnings and Notes

## 2.1 Safety instructions for repairs ⚠

1. Safety regulations require that during a repair:
   - The set should be connected to the mains via an isolating transformer;
   - Safety components, indicated by the symbol ⚠, should be replaced by components identical to the original ones;
   - When replacing the CRT, safety goggles must be worn.
2. Safety regulations require that after a repair the set must be returned in its original condition. In particular attention should be paid to the following points.
   - As a strict precaution, we advise you to resolder the solder joints through which the horizontal deflection current is flowing, in particular ('general repair instruction'):
     - All pins of the line output transformer (LOT);
     - Fly-back capacitor(s);
     - S-correction capacitor(s);
     - Line output transistor;
     - Pins of the connector with wires to the deflection coil;
     - Other components through which the deflection current flows.
     - Note:
     - This resoldering is advised to prevent bad connections due to metal fatigue in solder joints and is therefore only necessary for television sets older than 2 years.
   - The wire trees and EHT cable should be routed correctly and fixed with the mounted cable clamps.
   - The insulation of the mains lead should be checked for external damage.
   - The mains lead strain relief should be checked for its function in order to avoid touching the CRT, hot components or heat sinks.
   - The electrical DC resistance between the mains plug and the secondary side should be checked (only for sets which have a mains isolated power supply). This check can be done as follows:
     - Unplug the mains cord and connect a wire between the two pins of the mains plug;
     - Set the mains switch to the "on" position (keep the mains cord unplugged!);
     - Measure the resistance value between the pins of the mains plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 MΩ and 12 MΩ
     - Switch off the TV and remove the wire between the two pins of the mains plug.
   - The cabinet should be checked for defects to avoid touching of any inner parts by the customer.

## 2.2 Maintenance instruction

It is recommended to have a maintenance inspection carried out by a qualified service employee. The interval depends on the usage conditions:

- When the set is used under normal circumstances, for example in a living room, the recommended interval is 3 to 5 years.
- When the set is used in circumstances with higher dust, grease or moisture levels, for example in a kitchen, the recommended interval is 1 year.
- The maintenance inspection contains the following actions:
  - Execute the above mentioned 'general repair instruction'.
  - Clean the power supply and deflection circuitry on the chassis.
  - Clean the picture tube panel and the neck of the picture tube.

## 2.3 Warnings

1. ESD
2. All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential.
3. Available ESD protection equipment:
   - Complete kit ESD3 (small table mat, Wristband, Connection box, Extension cable and Earth cable) 4822 310 10671
   - Wristband tester 4822 344 13999
4. In order to prevent damage to ICs and transistors, all high-voltage flashovers must be avoided. In order to prevent damage to the picture tube, the method shown in Fig. 2.1 should be used to discharge the picture tube. Use a high-voltage probe and a multimeter (position DC-V). Discharge until the meter reading is 0V (after approx. 30s).
5. Together with the deflection unit and any multipole unit, the flat square picture tubes used form an integrated unit. The deflection and the multipole units are set optimally at the factory. Adjustment of this unit during repair is therefore not recommended.
6. Be careful during measurements in the high-voltage section and on the picture tube.
7. Never replace modules or other components while the unit is switched on.
8. When making settings, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.
9. Wear safety goggles during replacement of the picture tube.

## 2.4 Notes

The direct voltages and oscillograms should be measured with regard to the tuner earth (⏚), or hot earth (⏚) as this is called. The direct voltages and oscillograms shown in the diagrams are indicative and should be measured in the Service Default Mode (see chapter 8) with a colour bar signal and stereo sound (L:3 kHz, R:1 kHz unless stated otherwise) and picture carrier at 475.25 MHz.
Where necessary, the oscillograms and direct voltages are measured with (⊓) and without aerial signal (⋊). Voltages in the power supply section are measured both for normal operation (⏻) and in standby (⏻). These values are indicated by means of the appropriate symbols.
The picture tube PWB has printed spark gaps. Each spark gap is connected between an electrode of the picture tube and the Aquadag coating.
The semiconductors indicated in the circuit diagram and in the parts lists are completely interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.

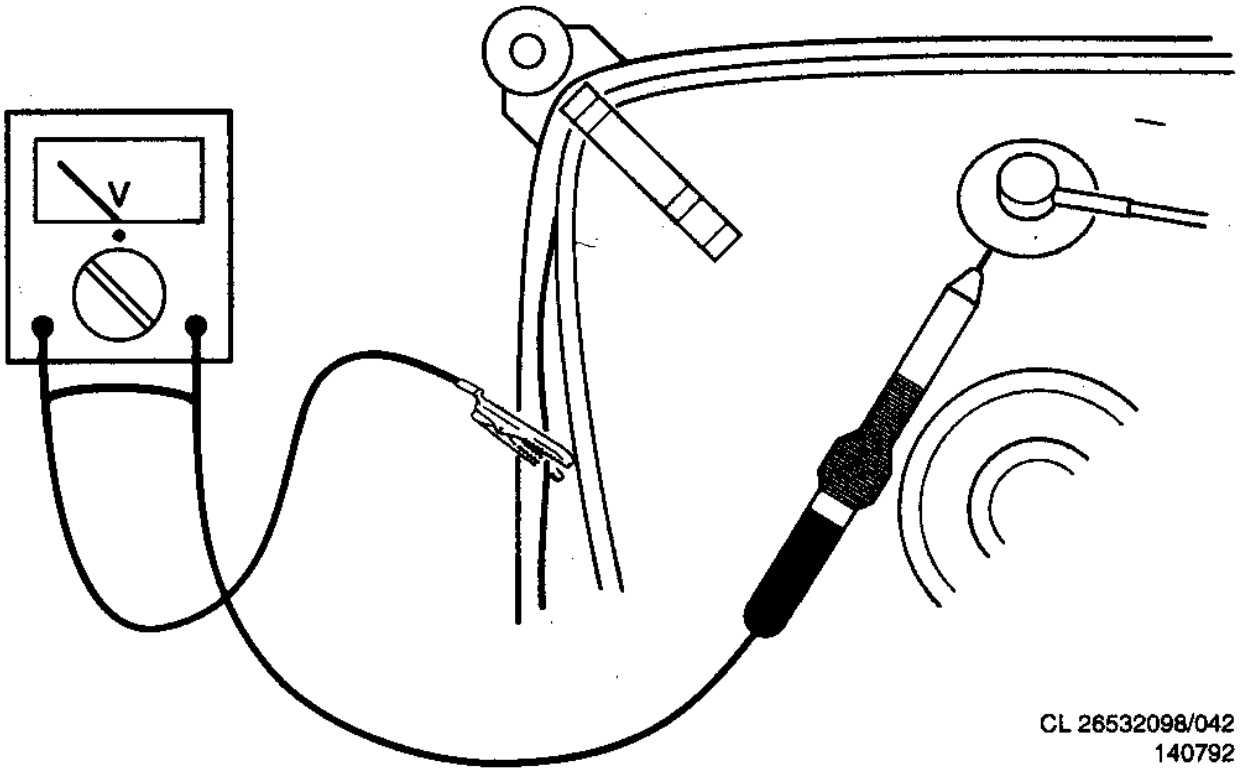


**Figure 2-1**

# 3. Directions for use

## Introduction

Thank you for purchasing this television set.
This handbook has been designed to help you install and operate your TV set.
We would strongly recommend that you read it thoroughly.
We hope our technology meets entirely with your satisfaction.

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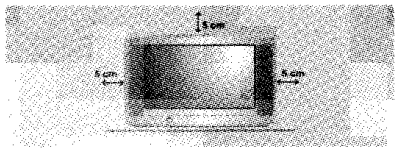
**Recycling**
The materials used in your set are either reusable or can be recycled.
To minimise environmental waste, specialist companies collect used appliances and dismantle them after retrieving any materials that can be used again (ask your dealer for further details).



## Installing your television set

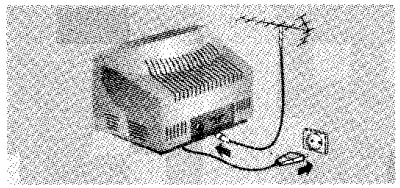
### ❶ Positioning the television set

Place your TV on a solid, stable surface, leaving a space of at least 5 cm around the appliance.
To avoid accidents, do not put anything on the set such as a cloth or cover, a container full of liquid (vase) or a heat source (lamp). The set must not be exposed to water.



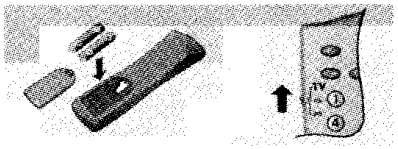

### ❷ Connections

- Insert the aerial plug into the ⊓⊓ socket at the rear of the set.
- Insert the mains plug into a wall socket (220-240 V / 50 Hz).



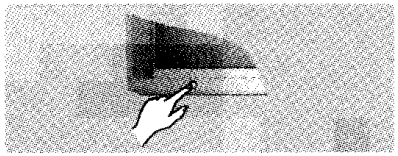
### ❸ Remote control

Insert the two R6-type batteries (supplied) making sure that they are the right way round.
Check that the mode selector is set to TV.
*The batteries supplied with this appliance do not contain mercury or nickel cadmium. If you have access to a recycling facility, please do not discard your used batteries (if in doubt, consult your dealer). When the batteries are replaced, use the same type.*




### ❹ Switching on

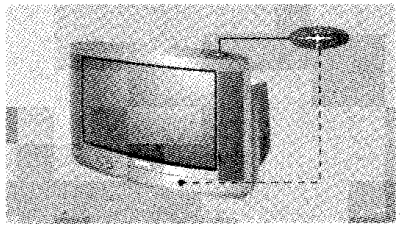
To switch on the set, press the on/off key.
A red indicator comes on and the screen lights up. Go straight to the chapter Quick installation on page 4.



If the television remains in standby mode, press P ⊕ on the remote control.
*The indicator will flashe when you use the remote control.*

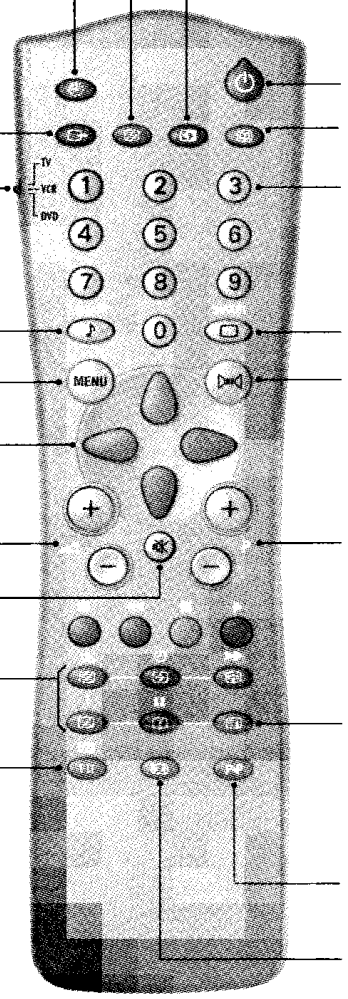
## The keys on the TV set

The television set has 4 keys which are located on the front or the top of the set depending on the model.



The VOLUME - + (- ◿ +) keys are used to adjust sound levels.
The PROGRAM - + (- P +) keys are used to select the required programmes.
To access the menus, simultaneously hold down the ◿ - and ◿ + keys. The PROGRAM - + keys may then be used to select an adjustment and the - ◿ + keys to make that adjustment.
To exit from the menus, hold down the 2 ◿ - and ◿ + keys.
*Note: when the CHILD LOCK function is activated, these keys are unavailable (refer to FEATURES menu on page 8).*

# The remote control keys



*key not used*

**Sleeptimer**
To select the length of time before the set automatically switches to standby (from 0 to 240 minutes)

**Select EXT sockets**
Press several times to select EXT1, EXT2 and on certain models EXT3 and S-VHS2.

**Mode selector (p. 13)**
To activate the remote control in TV,VCR (video recorder) or DVD mode.

**Smart sound controls**
To access a series of settings: VOICE, MUSIC, THEATRE and return to PERSONAL

**Menu**
To display or exit from the menus

**Cursor**
These 4 keys are used to move within the menus or to have direct access to the 16:9 formats (p 10).

**Volume**
To adjust the sound level

**Mute**
To disable or enable the sound.

**Teletext features** (p. 9)

**Sound mode**
To switch from STEREO to MONO or to choose between Dual I and Dual II for bilingual transmissions.
For TV sets fitted with NICAM reception, depending on the transmission, you can switch from NICAM STEREO to MONO or choose between NICAM DUAL I, NICAM DUAL II and MONO.
*When the sound mode is switched to MONO, the indication is displayed in red.*

**Contrast +**
To activate / de-activate the automatic contrast adjustment system (the dark areas are made darker whilst maintaining the detail).

**Standby**
To set the TV to standby mode.
To switch the TV set on again, press P ⊖ ⊕ or 0 9.

*key not used*

**Numerical keys**
For direct access to programmes. For a 2 digit programme number, the 2nd digit must be entered before the dash disappears.

**Smart picture controls**
To access a series of settings: RICH, NATURAL, SOFT, MULTIMEDIA and return to PERSONAL.

**Incredible Surround**
To activate / deactivate the surround sound effect. In stereo, this gives the impression that the speakers are further apart. In mono, a stereo spatial effect is simulated.

**Selecting TV programmes**
To move up or down a programme. The number, (the name) and the sound mode are displayed for a few seconds.
*For some programmes equipped with teletext, the title of the programme appears at the bottom of the screen.*

**Screen information**
To display / remove the programme number, the name (if it exists), the time, the sound mode and the time remaining on the timer. Hold down for 5 seconds to permanently display the programme number on the screen

**Previous programme**
To access the previously viewed programme.

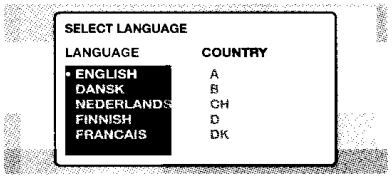
**16:9 formats** (p. 10)





# Quick installation

The first time you switch on the television, a menu appears on the screen.
This menu asks you to choose the language of the menus :

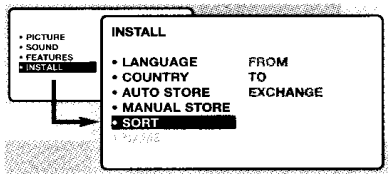



*If the menu does not appear, hold down the ◿ - and ◿ + keys on the set for 5 seconds to bring it up.*

1. Use the ◯◯ keys on the remote control to choose your language then confirm with ⊂⊃.
2. Then select your country using the ◯◯ keys and confirm with ⊂⊃.
*If your country does not appear in the list, select "..."*
3. Tuning starts automatically.
The operation takes several minutes.
A display shows the search status and the number of programmes found. When it has finished the menu disappears.
*To exit or interrupt the search, press the MENU key.*
*If no programmes are found, refer to the chapter entitled Tips on p. 14.*
4. If the transmitter or the cable network broadcasts the automatic sort signal, the programmes will be correctly numbered.
5. If not, the programmes found will be numbered in descending order starting at 99, 98, 97, etc. (or 79, 78, ...).
Use the SORT menu to renumber them.
*Some transmitters or cable networks broadcast their own sort parameters (region, language, etc.). Where this is the case, make your choice using the ◯◯ keys and confirm with ⊂⊃.*

# Sorting programmes

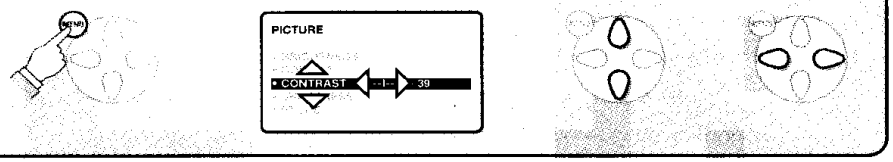
1. Press the MENU key. The main menu is displayed.
2. Select INSTALL (◯), then press ⊂⊃.
The INSTALL menu appears.




3. Using the ◯ key, select SORT then press ⊂⊃.
The SORT menu appears. The FROM option is activated.
*Note: this menu works as follows:*
- *Change "FROM" (enter the current programme number),*
- *"TO" (enter the new number),*
- *EXCHANGE numbers" (the operation is carried out).*

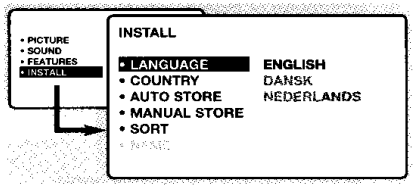
4. Select the programme you wish to renumber using ⊂⊃ keys or 0 to 9.
Example: to renumber programme 78 as 2 press 7 8.
5. Select TO (using ◯ key) and enter the new number with ⊂⊃ keys or 0 to 9 (for the example given, enter 2).
6. Select EXCHANGE (◯ key) and press ⊂⊃.
The message EXCHANGED appears, the exchange takes place. In our example, programme 78 is renumbered as 2 (and programme 2 as 78).
7. Select the option FROM (◯ key) and repeat stages 4 to 6 as many times as there are programmes to renumber.
8. To exit from the menus, press EXIT.

## Using other menus




## Choosing a language and country

1. Press the MENU key to display the main menu.
2. Select INSTALL (▽), then press ▷.
   The INSTALL menu appears.
   The LANGUAGE option is activated.

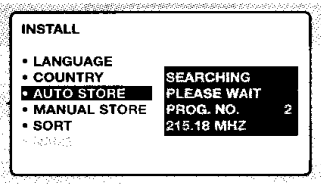



3. Press ▷ to go into the LANGUAGE menu.
4. Select your language with the △▽ keys.
   The menus will appear in the chosen language.
5. Press ◁ to exit the LANGUAGE menu.
6. Select the option COUNTRY and press ▷.
7. Select your country with △▽ keys (GB).
   *If your country does not appear in the list, select "..."*
8. Press ◁ to exit the COUNTRY menu.
9. To exit from the menus, press EXIT.

## Automatic tuning

This menu allows you to automatically search for all the programmes available in your region (or on your cable network).

1. First carry out operations 1 to 8 above, then:
2. Press ▽ once to select AUTO STORE then press ▷. The search begins.
   After several minutes, the INSTALL menu reappears automatically.




3. If the transmitter or the cable network broadcasts the automatic sort signal, the programmes will be correctly numbered.
4. If not, the programmes found will be numbered in descending order starting at 99, 98, 97, etc. (or 79, 78, ...).
   Use the SORT menu to renumber them.
   *Some transmitters or cable networks broadcast their own sort parameters (region, language, etc.). Where this is the case, make your choice using the △▽ keys and confirm with ▷.*
   *To exit or interrupt the search, press the MENU key. If no picture is found, refer to the chapter entitled Tips on p. 14.*
5. To exit from the menus, press EXIT.

## Manual tuning

This menu allows you to store the programmes one by one.

1. Press MENU.
2. Select INSTALL (▽), then press ▷.
   The INSTALL menu appears.
3. Select MANUAL STORE (▽) then press ▷.
   The menu appears :

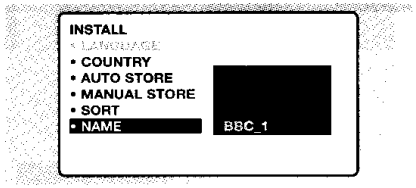
4. Press ▷ to go to the SYSTEM menu.
   Use △▽ to choose EUROPE (automatic detection*) or manual detection with WEST EUR (standard BG reception), EAST EUR (standard DK reception), UK (standard I reception) or FRANCE (standard LL').
   Then press ◁ to exit from the menu.
   ** Except for France (standard LL'): select the option FRANCE.*
5. Select SEARCH and press ▷.
   The search begins. As soon as a programme is found, the search will stop. If you know the frequency of the programme required, enter its number directly using the 0 9 keys and go to step 7.
   *If no programme is found, refer to the Tips chapter on page 14).*
6. If reception is un-satisfactory, select FINE TUNE and hold down ◁ or ▷ key.
7. Select PROG. NO (programme number) and use the ◁ ▷ or 0 to 9 keys to enter the desired number.
8. Select STORE and press ▷. The message STORED appears. The programme is stored.
9. Repeat steps 5 to 8 for each programme to be stored.

**To exit:** press the EXIT key.

## Programme name

You may, if you wish, give a name to the first 40 programmes (from 1 to 40).

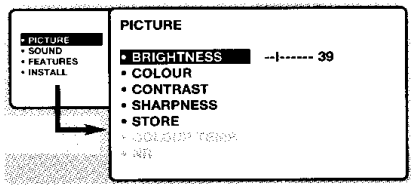
1. Press MENU.
2. Select INSTALL (▽), then press ▷.
   The INSTALL menu appears.
3. Press ▽ 5 times to select NAME (concealed at the bottom of the screen), then press ▷.
   The menu appears :




4. Select the programme you wish to name using the keys 0 9 or − P +.
   *Note: at the time of installation, the programmes are automatically named when the identification signal is transmitted.*
5. Use the keys ◁▷ to move within the name display area (5 characters).
6. Use keys △▽ to choose the characters.
7. Press MENU when the name has been entered.
   The programme name is stored.
8. Repeat steps 4 to 7 for each programme to be named.
9. To exit from the menus, press EXIT.

## Adjusting the picture

❶ Press MENU then ▷.
The PICTURE menu appears :

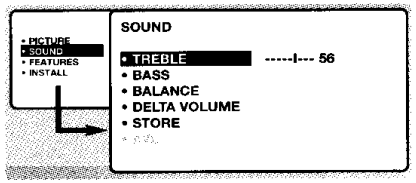



❷ Use △▽ keys to select a setting and ◁▷ keys to adjust.
*Note: the menu is a scroll-down menu. Keep the key ▽ held down to access the settings hidden at the bottom of the screen.*
❸ Once the necessary adjustments have been made, select the option STORE and press ▷ to store them.
❹ To exit from the menus, press EXIT.

**Description of the settings:**
- BRIGHTNESS: alters the brightness of the image.
- COLOUR: alters the colour intensity.
- CONTRAST: alters the variation between light and dark tones.
- SHARPNESS: alters the crispness of the image.
- STORE: stores the picture settings.
- COLOUR TEMP (colour temperature): adjusts the colour temperature of the picture. Three options are available here: COOL (blue white), NORMAL (balanced) or WARM (red white).
- NR (Noise Reduction): alleviates fuzziness (snowy picture). This setting is useful when reception is difficult.

## Adjusting the sound

❶ Press MENU, select the SOUND option (▽) and press ▷. The SOUND menu appears :




❷ Use △▽ keys to select a setting and keys ◁▷ to adjust.
*Note: to access the AVL setting (hidden at the bottom of the screen) hold down ▽ key.*
❸ Once the necessary adjustments have been made, select the option STORE and press ▷ to store them.
❹ To exit from the menus, press EXIT.

**Description of the settings:**
- TREBLE: alters the levelof the high frequency sound.
- BASS: alters the levelof the low frequency sound.
- BALANCE: to balance the sound between the left and right speakers.
- DELTA VOLUME (volume difference): allows you to compensate for the volume differences between the different programmes or the EXT sockets. This setting is available for programmes 1 - 40 and the EXT sockets.
- STORE: stores the sound settings.
- AVL (Automatic Volume Leveller): automatic volume control used to avoid sudden increases in volume, particularly when changing programmes or during advertisements

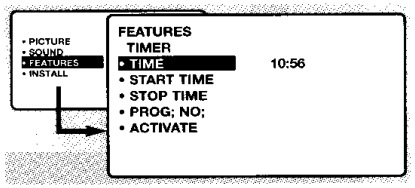
## Rotating the picture

*(only available on certain versions)*

Larger screens are sensitive to variations in the earth's magnetic field. This setting makes it possible to compensate for this phenomenon.
❶ Press MENU.
❷ Select FEATURES (▽) and press ▷.
The FEATURES menu appears.
❸ Use ▽ key to select ROTATION and use ◁▷ keys to alter the angle of the image.
❹ Press EXIT to exit from the menus.

## Timer function

This menu allows you to use your TV as an alarm clock.
❶ Press MENU.
❷ Select FEATURES (▽) and press ▷ twice.
The TIMER menu appears :




❸ Press ▷ to enter and exit the sub-menus and use keys △▽ or 0 9 to adjust:
❹ TIME: enter current time.
*Note: the time is updated automatically each time the set is switched on using teletext information taken from programme 1. If programme 1 does not have teletext, the update will not take place.*
❺ START TIME: enter the start time.
❻ STOP TIME: enter the stop time.
❼ PROG; NO;: enter the number of the programme required.
❽ ACTIVATE: you can set the alarm to be activated:
- ONCE ONLY for a one-off alarm,
- DAILY for a daily alarm or
- STOP to cancel.

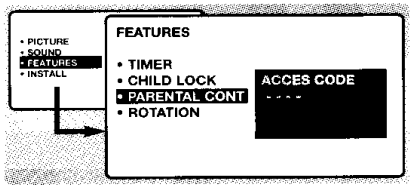
❾ Press EXIT to set the TV to standby. It will automatically switch on at the time programmed. If you leave the TV switched on, it will only change programme at the time indicated.
*The combination of the CHILD LOCK and TIMER functions may be used to limit the length of time your television is in use, for example, by your children.*

## Locking the set

You can bar access to certain programmes or completely lock the set by locking the keys.

### Locking programmes

❶ Press MENU.
❷ Select FEATURES (▽) and press ▷.
❸ Select PARENTAL. CONT. (▽) and press ▷.




❹ Enter your confidential access code. The first time, enter the code 0711 then confirm by re-entering 0711. The menu appears.
❺ Press ▷ to go into the menu.
❻ Use keys △▽ to select the required programme and confirm with ▷. The symbol 🔒 is displayed alongside the programmes or sockets that have been locked.
❼ Press EXIT to exit.
To watch a programme which has been locked you will now need to enter the confidential code; otherwise the screen will remain blank.
*Caution: in the case of encrypted programmes which use an external decoder, it is necessary to lock the corresponding EXT socket.*

**To unlock all programmes**
Repeat stages ❶ to ❹ above, then select CLEAR ALL and press ▷.

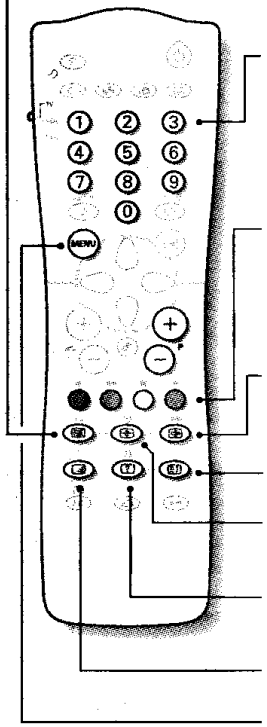
**To change the confidential code**
Repeat stages ❶ to ❹ above, then:
❺ Select CHANGE CODE and enter your own 4-digit number.
❻ Confirm by entering it again.
Your new code will be stored.
❼ Press EXIT to exit from the menus.

### Locking the keys

❶ Press MENU, select FEATURES (▽) and press ▷.
❷ Select CHILD LOCK (▽) and press ▷.
❸ Enter your confidential access code.
❹ Press ▷ to set the lock to ON.
❺ Switch off the set and put the remote control out of sight.
The set cannot be used (it can only be switched on using the remote control).
❻ To cancel: switch CHILD LOCK to OFF.

## Teletext

Teletext is an information system, broadcast by certain channels, which can be read like a newspaper. It also provides subtitles for people with hearing difficulties or those who are unfamiliar with the language in which a particular programme is being broadcast (cable networks, satellite channels, etc.).



**Switch teletext on/off**
To call up or exit from teletext. At first, the main index page appears with a list of the items available. Each page has a corresponding 3-figure number.
*If the selected channel does not broadcast teletext, 100 will appear and the screen will remain blank (in this case, exit from teletext and choose another channel).*

**Selecting a teletext page**
Use keys 0 to 9 or − P + to enter the page number required.
For example: for page 120, press 1 2 0.
The number is displayed in the top left-hand corner, the page counter starts searching and the page is displayed. Repeat the procedure to consult another page.
*If the counter continues searching, this means that the selected page is not broadcast. Choose another number.*

**Direct access to subject headings**
Coloured zones are displayed at the bottom of the screen. The 4 coloured keys give access to the corresponding subjects or pages.
*The coloured zones flash when the subject or the page is not yet available.*

**Stop the sequence of sub-pages**
Some pages contain sub-pages which follow on automatically from one another. This key allows sub-page sequence to be enabled or disabled. The sign appears in the top left hand corner.

**Table of contents**
To return to the table of contents (normally page 100).

**Page enlargement**
Press this key to display the upper, then lower part of the screen, and then to return to the normal page size.

**Reveal**
Use this key to reveal/conceal hidden information (answers to puzzles).

**Overlaying text on the TV picture**
To activate or deactivate screen overlay.

**Favourite pages**
*(available only on certain models)*
For teletext programmes 1 to 40, you can store 4 favourite pages which you can then access via the coloured keys.

1. Press MENU.
2. Enter the number of the page required.
3. Press then the coloured key of your choice. The page is stored.
4. Repeat steps 2 and 3 for the other coloured keys.
5. From now on, when you consult teletext, your favourite pages appear in colour at the bottom of the screen.
   To get back to the normal subject headings, press MENU.

*To remove these settings, hold down for 5 seconds.*

## 16:9 Formats

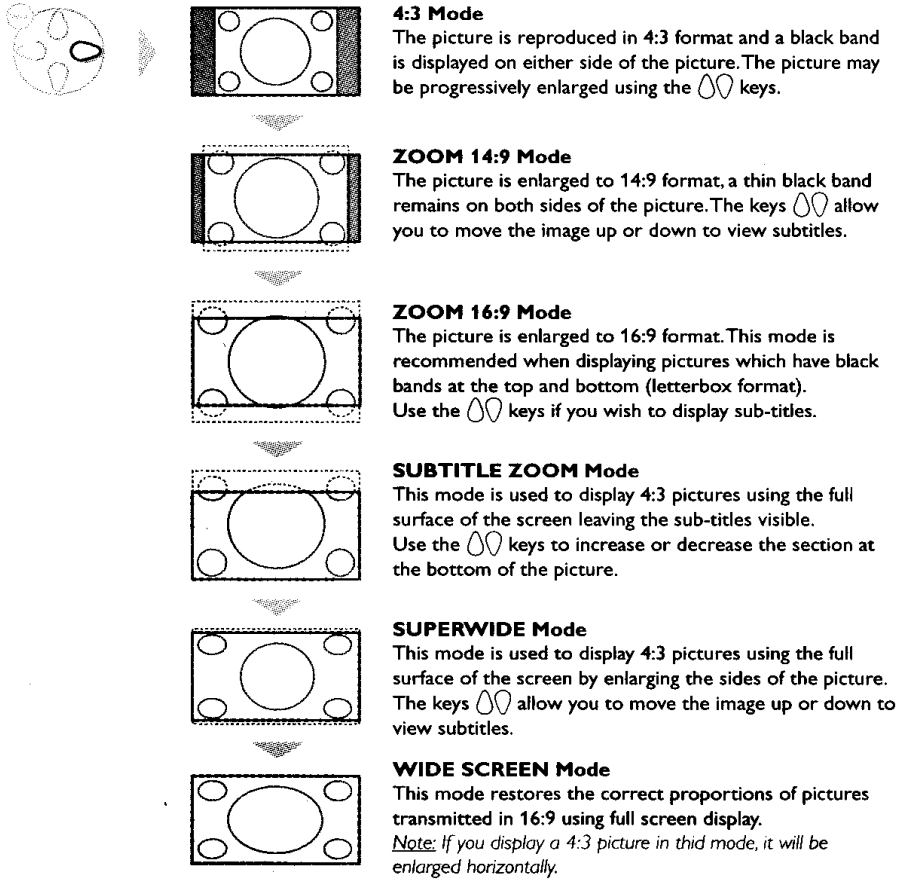
The pictures you receive may be transmitted in 16:9 format (wide screen) or 4:3 format (conventional screen). 4:3 pictures sometimes have a black band at the top and bottom of the screen (letterbox format). This function allows you to optimise the picture display on screen.

### Automatic switching

This TV set is also equipped with automatic switching which will select the correct-screen format, provided the specific signals are transmitted with the programmes.
*This automatic format can also be modified manually.*

### Using the different screen formats

Press the key (or ) to select the different modes:
4:3, ZOOM 14:9, ZOOM 16:9, SUBTITLE ZOOM, SUPER ZOOM and WIDE SCREEN.
*You can also access these settings with key .*



**4:3 Mode**
The picture is reproduced in 4:3 format and a black band is displayed on either side of the picture. The picture may be progressively enlarged using the keys.

**ZOOM 14:9 Mode**
The picture is enlarged to 14:9 format, a thin black band remains on both sides of the picture. The keys allow you to move the image up or down to view subtitles.

**ZOOM 16:9 Mode**
The picture is enlarged to 16:9 format. This mode is recommended when displaying pictures which have black bands at the top and bottom (letterbox format).
Use the keys if you wish to display sub-titles.

**SUBTITLE ZOOM Mode**
This mode is used to display 4:3 pictures using the full surface of the screen leaving the sub-titles visible.
Use the keys to increase or decrease the section at the bottom of the picture.

**SUPERWIDE Mode**
This mode is used to display 4:3 pictures using the full surface of the screen by enlarging the sides of the picture.
The keys allow you to move the image up or down to view subtitles.

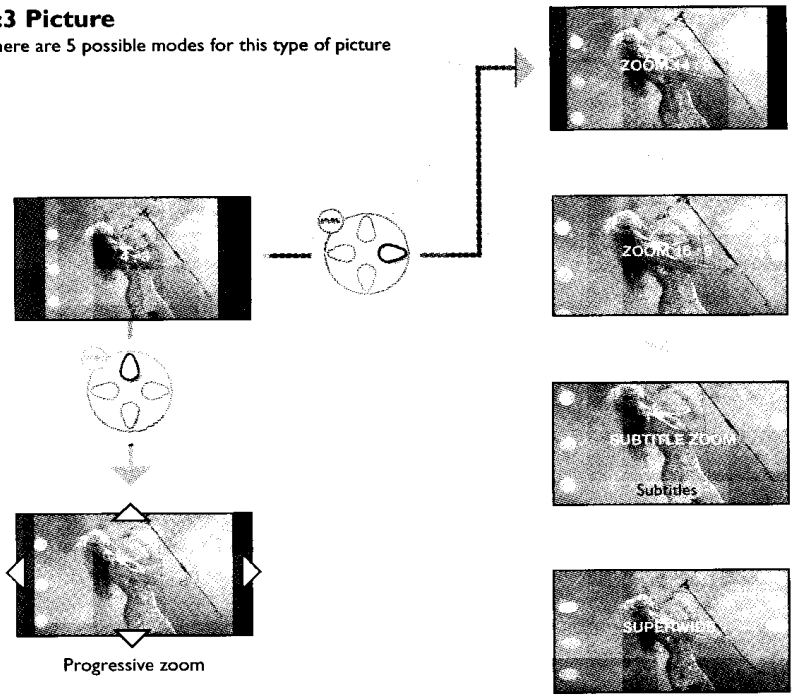
**WIDE SCREEN Mode**
This mode restores the correct proportions of pictures transmitted in 16:9 using full screen display.
*Note: If you display a 4:3 picture in thid mode, it will be enlarged horizontally.*

## Selecting the correct mode

Different modes can be selected to suit different picture formats, use the following diagrams as a guide to which mode to use.

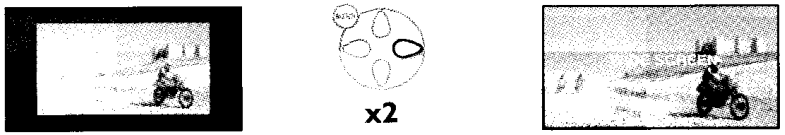
### ❶ 4:3 Picture

There are 5 possible modes for this type of picture



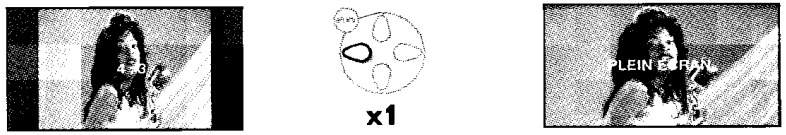

Progressive zoom

### ❷ 4:3 Picture Letterbox



x2

### ❸ 16:9 Picture

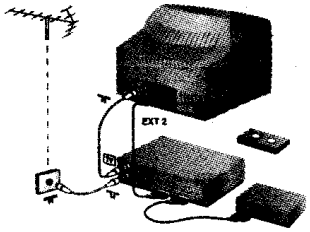


x1

## Connecting peripheral equipment

**The television has 2 external sockets situated at the back of the set (EXT1 and EXT2).**
*The EXT1 socket has audio and video inputs/outputs and RGB inputs.*
*The EXT2 socket has audio and video inputs/outputs and S-VHS inputs.*

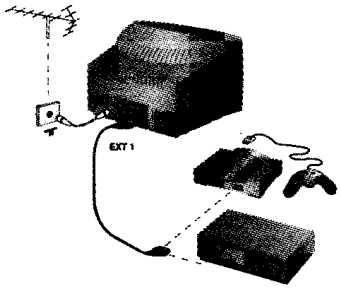
### Video recorder



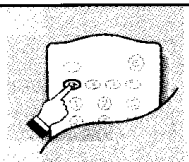

**Video recorder (only)**
**Carry out the connections featured opposite. Use a good quality euroconnector cable.**
*If your video recorder does not have a euroconnector socket, the only connection possible is via the aerial cable. You will therefore need to tune in your video recorder's test signal and assign it programme number 0 (refer to manual store, p. 6).*
*To reproduce the video recorder picture, press* ⓪.

**Video recorder with decoder**
Connect the decoder to the second euroconnector socket of the video recorder. You will then be able to record scrambled transmissions.

### Other equipment



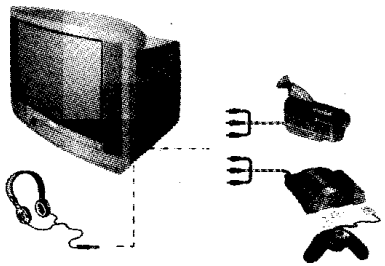

**Satellite receiver, decoder, CDV, games, etc.**
Carry out the connections featured opposite.
To optimise picture quality, connect the equipment which produces the RGB signals (digital decoder, games, etc.) to EXT1, and the equipment which produces the S-VHS signals (S-VHS and Hi-8 video recorders, certain CDV drives) to EXT2 and all other equipment to either EXT1 or EXT2.



### To select connected equipment

Press the ⊡ key to select EXT1, EXT2, S-VHS2 (S-VHS signals from the EXT2 socket) and EXT3 for connections on the front panel.
*Most equipment (decoder, video recorder) carries out the switching itself.*

## Connecting other appliances



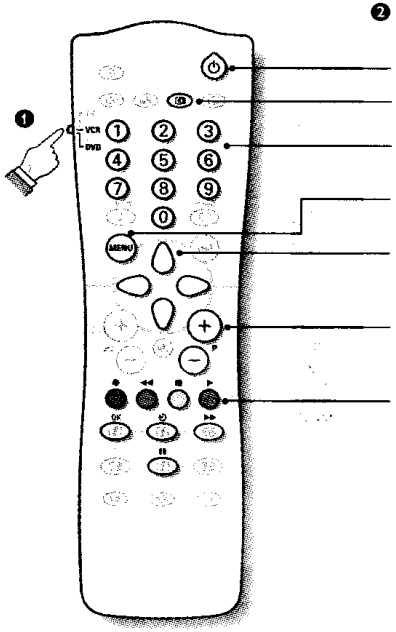
**Connect other appliances as shown opposite.**
**Select EXT 3 by pressing ⊡.**
*For a monophonic camera, connect the sound signal to the AUDIO L input. Use the (I-II) key to reproduce the sound through the left and right TV speakers.*

**Headphones**
**Keys ⊖ ◿ ⊕ allow you to adjust the volume on the headphones and on the set. Press OK if you want to cut off the sound on the set.**
*The headphones must have an impedance of between 32 and 600 ohms.*

## TV / VCR / DVD mode selector

The remote control allows you to control the main functions of your video recorder or DVD.

❶ Set the switch on the side of the remote control to the required mode: TV, VCR (video recorder) or DVD.
❷ Then press one of the following keys:




- standby
- contrast + setting *
- enter a number
- bring up a menu *
- select (◯◯) and set (◯◯) *
- select programme,
- ● record *,
- ◀◀ rewind,
- ■ stop,
- ▶ play,
- ▶▶ fast forward,
- ⏲ programming *,
- OK confirm*
- ❚❚ pause

* *Some programming functions are not available on all models (cursors, menu, OK key, etc.).*
*The remote control is compatible with all the video recorders in our range as well as models which use the RC5 signalling standard.*



## Tips

**Poor reception**
The proximity of mountains or high buildings may be responsible for ghost pictures, echoing or shadows. In this case, try manually adjusting your picture: see "fine tuning" (p.6) or modify the orientation of the outside aerial. Does your antenna enable you to receive broadcasts in this frequency range (UHF or VHF band)?
In the event of difficult reception (snowy picture) switch the NR on the PICTURE menu to ON. (p. 7).

**No picture**
Have you connected the aerial socket properly? Have you chosen the right system? (p. 6) Is the contrast or the brightness badly adjusted ? Press ◯ and readjust the PICTURE menu. Poorly connected euroconnector cables or aerial sockets are often the cause of picture or sound problems (sometimes the connectors can become half disconnected if the TV set is moved or turned). Check all connections.

**Peripheral equipment gives a black and white picture**
You have not selected the right socket with the ⊡ key: S-VHS2 instead of EXT2.
To play a video cassette, check that it has been recorded under the same standard (PAL, SECAM, NTSC) which can be replayed by the video recorder.

**The remote control no longer works.**
Check that the mode selector on the side of the remote control is set to TV.

**No sound**
If on certain channels you receive a picture but no sound, this means that you do not have the correct TV system. Modify the SYSTEM setting (p. 6).

**Remote control**
The TV set does not react to the remote control; the indicator on the set no longer flashes when you use the remote control? Replace the batteries.

**Standby**
When you switch the TV set on it remains in standby mode and the indication LOCKED is displayed when you use the keys on the TV set? The CHILD LOCK function is switched on (p. 8).
If the set receives no signal for 15 mins, it automatically goes into standby mode.
To save power, your set is fitted with components that give it a very low power consumption when in standby mode (less than 3 W).

**Cleaning the set**
Only use a clean, soft and lint-free cloth to clean the screen and the casing of your set. Do not use alcohol-based or solvent-based products.

**Still no results?**
If your TV set breaks down, never attempt to repair it yourself: contact your dealer's after-sales service.

## Glossary

**RGB Signals:** These are 3 Red, Green and Blue video signals which directly drive the red, green and blue emitters in the cathode ray tube. Using these signals provides better picture quality.

**S-VHS Signals:** These are 2 separate Y/C video signals from the S-VHS and Hi-8 recording standards. The luminance signals Y (black and white) and chrominance signals C (colour) are recorded separately on the tape. This provides better picture quality than with standard video (VHS and 8 mm) where the Y/C signals are combined to provide only one video signal.

**NICAM sound:** Process by which digital sound can be transmitted.

**System:** Television pictures are not broadcast in the same way in all countries. There are different standards: BG, DK, I, and L L'. The SYSTEM setting (p. 4) is used to select these different standards. This is not to be confused with PAL or SECAM colour coding. Pal is used in the majority of European countries, Secam in France, the CIS and the majority of African countries.
The United States and Japan use a different system called NTSC. The inputs EXT1 and EXT2 are used to read NTSC coded recordings.

**16:9:** Refers to the ration between the length and height of the screen.
Wide screen televisions have a ration of 16/9, conventional screen TV sets have a ration of 4/3.

# 4. Mechanical instructions

## 4.1 Accessing the service connector (for ComPair)

1. Connect the ComPair cable to connector 0229 (in front of the Tuner).
2. Start ComPair and perform the diagnosis (for more info see chapter 5).

## 4.2 Removing the Rear Cover

1. Remove all the fixation screws of the rear cover.
2. Now the rear cover can be removed.

## 4.3 Service position

The following PWB's are present in this chassis (see also 'Chassis overview', chapter 1):

1. Large Signal Panel (LSP)
2. Small Signal Board (SSB)
3. Top Control panel
4. CRT panel (or PTP)
5. Side I/O panel
6. Mains Switch/LED panel

### 4.3.1 Service position LSP

Position 1: For better accessibility of the LSP, do the following:

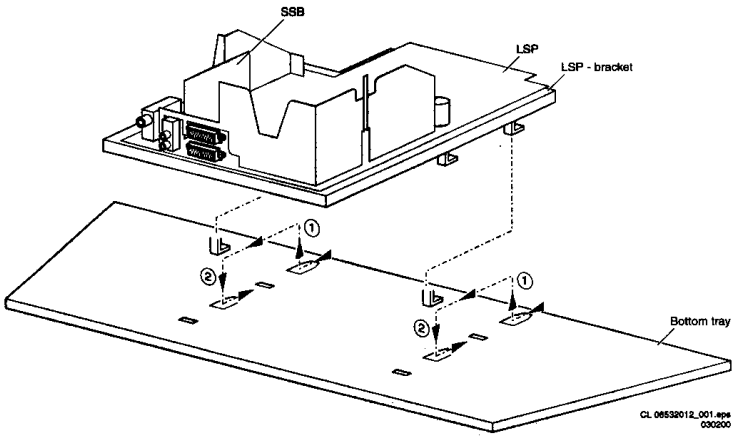



**Figure 4-1**

1. Remove the LSP-bracket from the bottom tray by pulling it backwards.
2. Hook the bracket in the first row of fixation holes of the cabinet bottom. In other words reposition the bracket from (1) to (2).

Position 2: To get access to the bottom side (solder side) of the LSP, do the following:

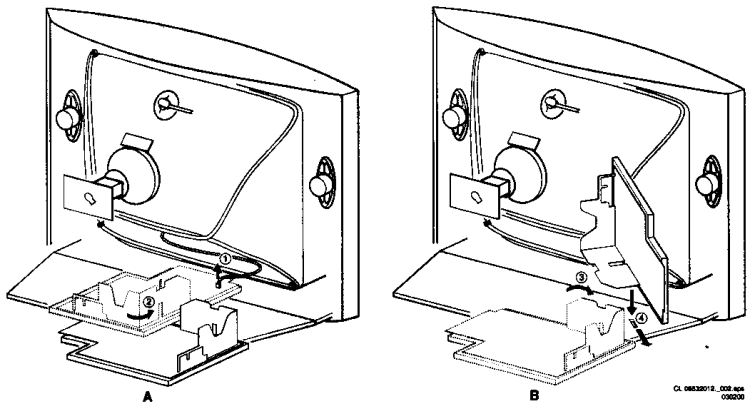



**Figure 4-2**

1. Disconnect the degaussing coil from the LSP by removing the cable on connector 0211 (1).
2. Release some of the wiring from their fixation clamps, in order to get room for repositioning the LSP.
3. Turn the chassis tray 90 degrees counter clockwise (2).
4. Flip the tray with the rear I/O panel towards the CRT (3).
5. Place the hook of the tray in the fixation hole at the right side of the cabinet bottom (4) and pull the chassis tray forward.

### 4.3.2 Service position SSB

In fact there is no predefined service position for the bottom (B-) side of the SSB. All relevant test points can be accessed in both service positions.

If IC's must be replaced: take the complete panel out of the SIMM-connector.

1. Put the LSP in service position 1 (as described above).
2. Release the 2 metal clamps at both sides of the SIMM-connector and the complete SSB can be taken out. It 'hinges' in the SIM-connector.

### 4.3.3 Accessing the Top Control panel

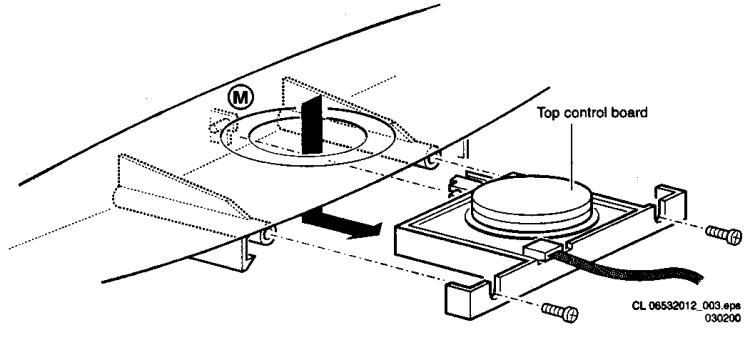



**Figure 4-3**

1. Remove the two fixation screws, which hold the panel.
2. Pull the board backward (w.o.w. release it from the front hinge).

### 4.3.4 Accessing the Side I/O panel

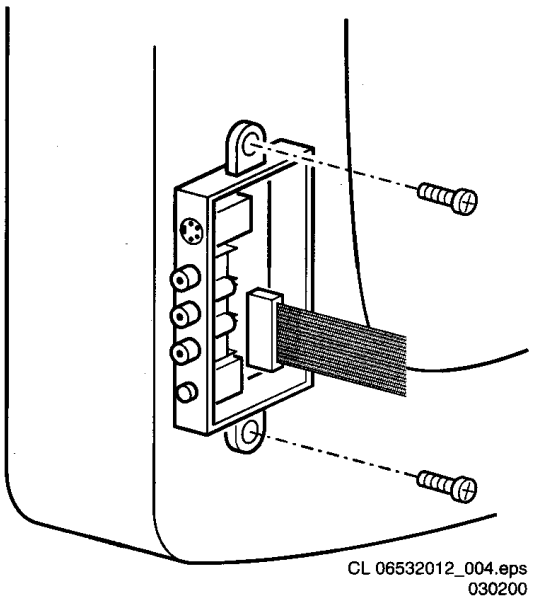



**Figure 4-4**

1. The complete Side I/O-assembly can easily be removed by unscrewing the 2 fixation screws.
2. The board can easily be lifted out of the bracket after releasing the 2 fixation clamps.

### 4.3.5 Accessing the Mains Switch/LED panel

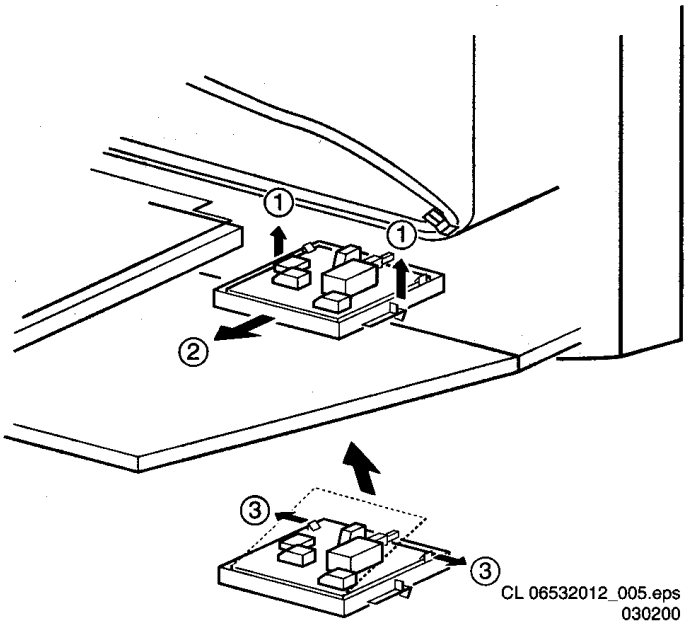



**Figure 4-5**

1. Release the two fixation clamps (1) by pushing them upward.
2. At the same time, the complete assy must be pulled backward (2).
3. If the board has to be removed, release the 2 clamps at the sides of the bracket and lift panel out (3).

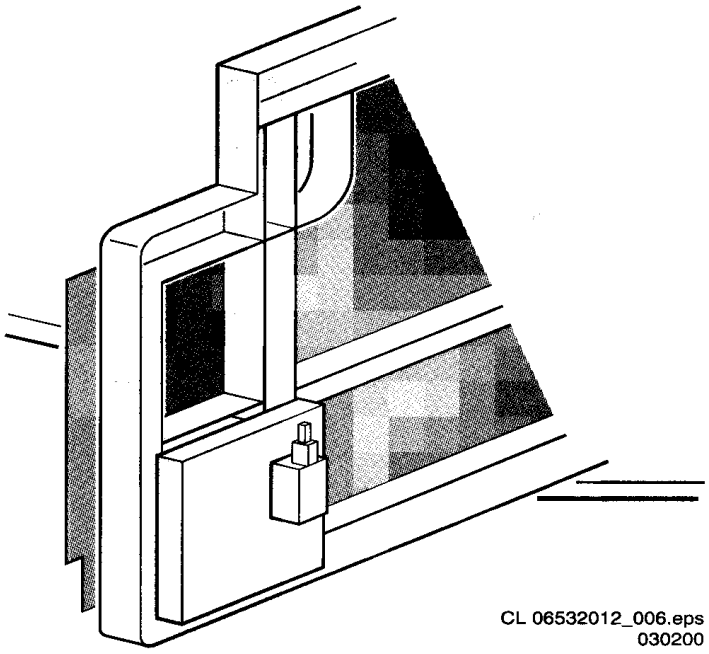



**Figure 4-6**

1. For easy measurements, panel can be clicked to the LSP bracket.

## 4.4 Mounting the Rear Cover

Before mounting the Rear Cover, some checks has to be performed:

- Check whether the Mains Cord is mounted correctly in the guiding brackets.
- Check whether all cables are replaced in their original position.

# 5. Service Modes, error messages and repair tips

In this chapter the following paragraphs are included:
5.1 Test points
5.2 Service Modes and Dealer Service Tool (DST)
5.3 Error code buffer and error codes
5.4 The "blinking LED" procedure
5.5 Trouble shooting tips
5.6 Customer Service Mode

## 5.1 Test points

The A10 chassis is equipped with test points in the service printing. These test points are referring to the functional blocks:
- A1-A2-A3, etc.: Test points for the audio processing circuitry [A6, C6]
- C1-C2-C3, etc.: Test points for the control circuitry [C8]
- F1-F2-F3, etc.: Test points for the frame drive and frame output circuitry [A3]
- I1-I2-I3, etc.: Test points for the intermediate frequency circuitry [A4, C1]
- L1-L2-L3, etc.: Test points for the line drive and line output circuitry [A2]
- P1-P2-P3, etc.: Test points for the power supply [A1]
- S1, S2, S3, etc.: Test points for the synchronisation circuitry [C1]
- V1-V2-V3, etc.: Test points for the video processing circuitry [B, C2, C3]

Measurements are performed under the following conditions:
Video: colour bar signal; audio: 3kHz left, 1kHz right

## 5.2 Service modes and Dealer Service Tool (DST)

For easy installation and diagnosis the dealer service tool (DST) RC7150 can be used. When there is no picture (to access the error code buffer via the OSD), DST can enable the functionality of displaying the contents of the entire error code buffer via the blinking LED procedure.

### 5.2.1 Installation features for the dealer

The dealer can use the RC7150 for programming the TV-set with presets. 10 Different program tables can be programmed into the DST via a GFL TV-set (downloading from the GFL to the DST; see GFL service manuals) or by the DST-I. For explanation of the installation features of the DST, the directions for use of the DST are recommended (For the A10 chassis, download code 4 should be used).

### 5.2.2 Diagnose features for the service engineer

A10 sets can be put in the two service modes via the RC7150. These are the Service Default Mode (SDM) and the Service Alignment Mode (SAM). SDM can also be entered by short circuiting the jumpers 9261 and 9262 on the chassis with a screwdriver.

***Service Default Mode (SDM)***
The purpose of the SDM is:
- provide a situation with predefined settings to get the same measurements as in this manual
- start the blinking LED procedure
- have the possibility to override the 5V protection

Entering the SDM:
- By transmitting the "DEFAULT" command with the RC7150 Dealer Service Tool (this works both while the set is in normal operation mode or in the SAM)
- Standard RC sequence 0-6-2-5-9-6 followed by pressing the "MENU"-button
- By shorting jumpers 9261 and 9262 on the monocarrier while switching on the set

By temporarily shorting jumper 9261 and 9262 when switching on the set, the 5V protection is disabled.
CAUTION ! Overriding the 5V protection should only be used for a short period of time. In case of S/W protections ( error 1-4 ) the set will shutdown after 15 sec.
For recognition of the SDM, "SDM" is displayed at the upper right side of the screen.

**SDM Menu**

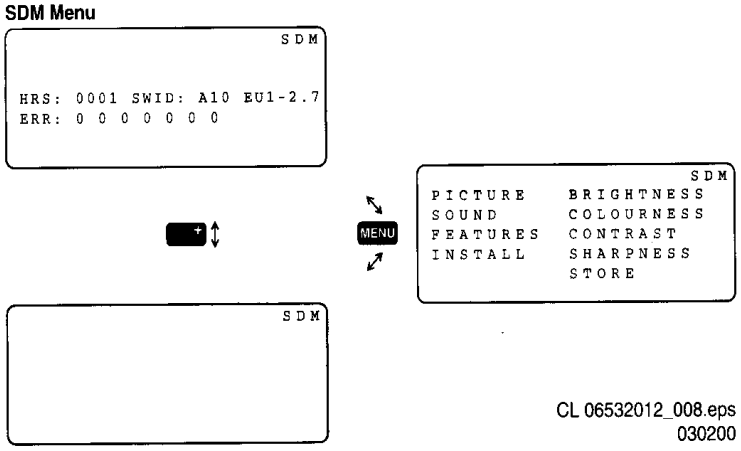



**Figure 5-1**

Exit the SDM:
- Press the "EXIT"-button on the DST
- Switch the set to Standby (the error buffer is also cleared)

Note: When the mains power is switched off while the set is in SDM, the set will switch to SDM immediately when the mains is switched on again.
The SDM sets the following pre-defined conditions:
- PAL/Secam sets: tuning at 475.25 MHz PAL
- NTSC sets: tuning at channel 3 (61.25MHz)

Volume level is set to 25% (of the maximum volume level). Other picture and sound settings are set to 50%. The following functions are switched off in SDM (and after leaving SDM):
- Timer
- Sleep timer

The following functions are disabled during SDM (and enabled after leaving SDM)
- Parental lock
- Blue mute
- Hospitality Mode
- No-ident Timer (normally the set is automatically switched off when no video signal (IDENT) was received for 15 minutes).

All other controls operate normally.

***Special functions in SDM***

*Access to normal user menu*
Pressing the "MENU" button on the remote control switches between the SDM and the normal user menus (with the SDM mode still active in the background)

*Channel search*
Pressing the "P+" button of the remote control starts a tuning search. Search is indicated by a blinking LED (this stops when a transmitter is found; the transmitter is stored on the highest channel number, typically this is 99 and the TV switches to this preset)

*Error buffer*
Pressing the "OSD" button of the remote control shows/hides the error buffer. OSD can be hidden to prevent interference with oscillogram measurements.

*Access to SAM*
By pressing the "VOLUME +" and "VOLUME -" buttons on the local keyboard simultaneously the set switches from SDM to SAM.

***Service Alignment Mode (SAM)***
The purpose of the SAM is:
- to do alignments
- Change option settings
- display/clear the error code buffer values.

*Entering SAM:*
- By transmitting the "ALIGN" command with the RC7150 Dealer Service Tool (this works both while the set is in normal operation mode or in the SDM)
- By pressing the "VOLUME +" and "VOLUME -" key on the local keyboard simultaneously when the set is in SDM
- Standard RC sequence 0-6-2-5-9-6 followed by pressing the "OSD"-button

*Exit SAM:*
Switch the set to Standby (the error buffer will be erased)
Note: When the mains power is switched off while the set is in SAM, the set will enter to SAM immediately when the mains is switched on again.
In the SAM the following information is displayed on the screen:

**SAM Menu**

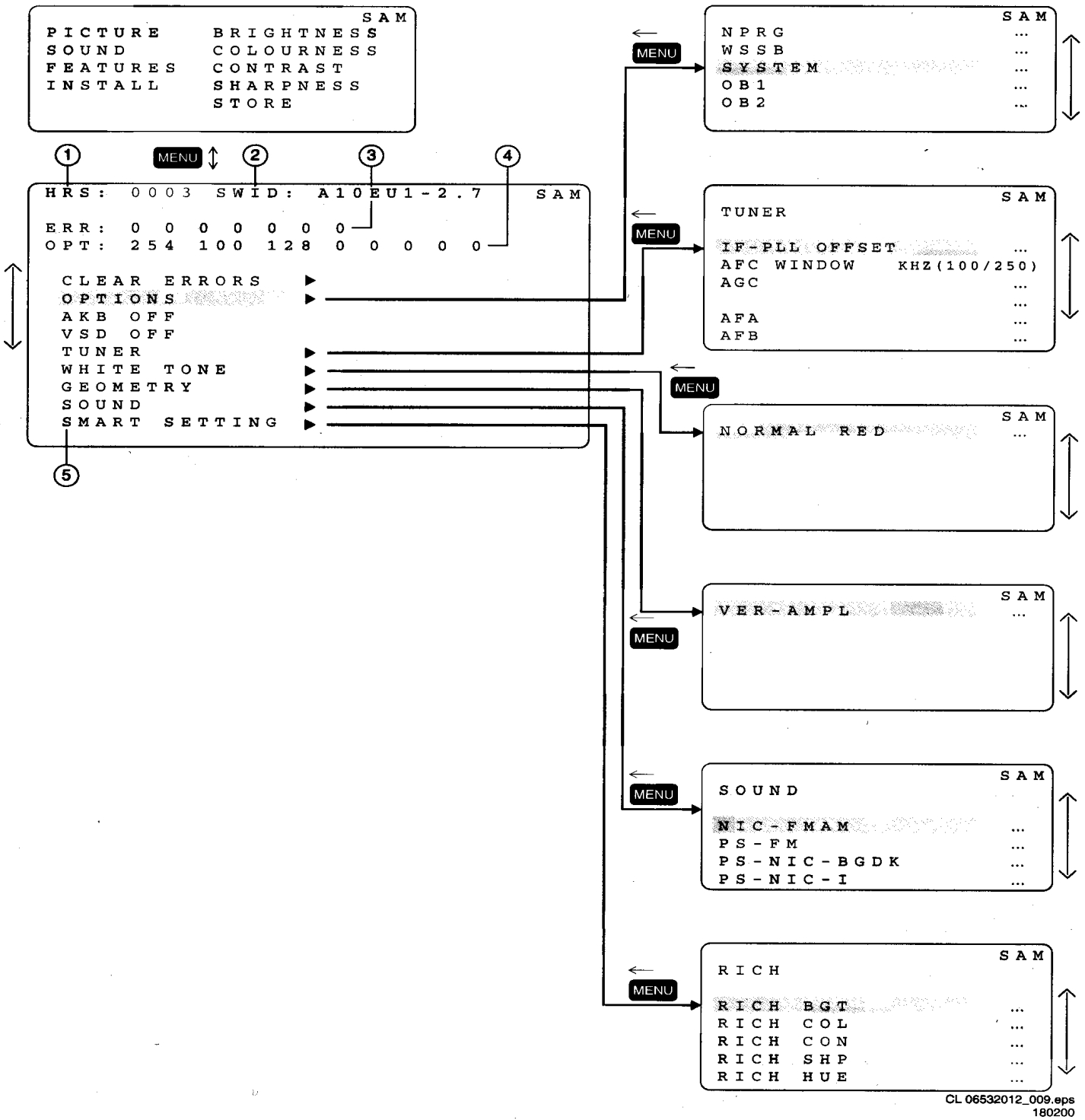



Figure 5-2

***Explanation notes/references:***

1. Operation hours timer (hexadecimal)
2. Software identification of the main micro controller (A10BBC-X.Y)
   - A10 is the chassis name for A10
   - BBC is 2 letter and 1 digit combination to indicate the software type and the supported languages:
   - X = (main version number)
   - Y = (subversion number)
3. Error buffer (7 errors possible)
4. Option bytes (8 codes possible), summary of options are explained below
5. Sub menus are listed in a scroll-menu.

*SAM menu control*

Menu items can be selected with the cursor UP/DOWN key. The selected item will be highlighted. When not all menu items fit on the screen, moving the cursor UP/DOWN will display the next/previous menu items.
With the cursor LEFT/RIGHT keys, it is possible to:

- (de)activate the selected menu item (e.g. GEOMETRY)
- change the value of the selected menu item ( e.g VER-SLOPE )
- activate the selected submenu (e.g SERV-BLK)

*Access to normal user menu*

Pressing the "MENU" button on the remote control switches between the SDM and the normal user menus (with the SAM mode still active in the background). Pressing the "MENU" key in a submenu will go to the previous menu.

***The menus and submenus***

*CLEAR ERRORS*

Erasing the contents of the error buffer. Select the CLEAR ERRORS menu item and press the MENU RIGHT key. The contents of the error buffer is cleared.
The functionality of the OPTIONS and ALIGNMENTS (TUNER, WHITE TONE, GEOMETRY, SOUND and SMART SETTING) sub menus is described in chapter 8.

## 5.3 Error code buffer and error codes

### 5.3.1 Error code buffer

The error code buffer contains all errors detected since the last time the buffer was erased. The buffer is written from left to right. when an error occurs that is not yet in the error code buffer, the error is written at the left side and all other errors shift one position to the right.
The error code buffer will be cleared in the following cases:

- by activating the "CLEAR ERRORS" in SAM menu
  - exiting SDM or SAM with the "Standby" command on the remote control
  - transmitting the commands "DIAGNOSE 99 OK" with the DST (RC7150) or with ComPair
- Automatically reset if its contents has not changed for 50 hours

By leaving SDM or SAM with the mains switch, the error buffer is not reset.

Examples:
ERROR: 0 0 0 0 0 0 0 : No errors detected
ERROR: 6 0 0 0 0 0 0 : Error code 6 is the last and only detected error
ERROR: 9 6 0 0 0 0 0 : Error code 6 was first detected and error code 9 is the last detected (newest) error
The contents of the error buffer can also be made visible through the "blinking LED" procedure. This is especially useful when there is no picture. See paragraph 5.4 "The blinking LED procedure ".

### 5.3.2 Error codes

In case of non-intermittent faults, clear the error buffer before starting the repair, to prevent that "old" error codes are present. If possible check the entire content of the error buffers. In some situations an error code is only the result of another error code (and not the actual cause).
Note: a fault in the protection detection circuitry can also lead to a protection.
Error 0 = No error
Error 1 = X-ray protection, E/W protection and/or IBeam
X-ray protection, E/W protection and/or IBeam; set is switched to protection; error code 1 is placed in the error buffer; the LED will blink 1 time (repeatedly). If this happens, isolate each circuit to determine the cause. These circuits are:

- X-Ray protection - PROTN

If this protection is active, the most likely cause is the LOT. Detection via pin 3 of the BOCMA - item 7301.

- EW protection - PROT-UP

If this protection is active, the causes could be one of the following;

- bad contacts of:
  - horizontal deflection coil
  - linearity coil 5417
  - S-correction capacitor 2418/2419
  - flyback capacitor 2414/2416
  - line output stage
- short circuit of:
  - flyback diode 6414
  - EW transformer (bridge coil) 5478/5479 or 5474/5475/5476 (version dependent)
  - EW driver 7470
- High beam current protection - IBeam

As the name implies, the cause of this protection is a too high beam current (bright screen with flyback lines). Check whether the +200V supply to the CRT panel is present. If the voltage is present, the most like cause is the CRT panel or the picture tube. Disconnect the CRT panel to determine the cause. If the +200V voltage is not present, check R3840 at CRT-panel and R3445 & D6445 at main panel.
Error 2 = Vertical protection - VFB
If this protection is active, the cause could be one of the following (most likely in the vertical output stage):

- 7501 is faulty
- poor contact or open circuit of deflection coil
- +13V-VERT and/or -13V not present

Error 3 = Reserved
Error 4 = +5V protection
5V protection active; set is switched to protection; error code 4 is placed in the error buffer; the LED will blink 4 times (repeatedly). A 5V failure can cause a drop in the 5V supply output, resulting in an undefined behaviour of the set. Therefore, all $I^2C$ devices connected to the 5V supply are constantly monitored. When none of these devices responds to the micro controller for a prolonged time, the micro controller assumes that there is a failure in the 5V supply.
By starting up the set with the service jumpers shorted, the 5V protection is disabled and it is easier to determine the cause.
+5V protection will be activated when these $I^2C$ devices fail (no $I^2C$ communication):

- Main Tuner 1125 on main panel
- ITT sound processor MSP34xx ( 7064 ) on the SSB

The following tips are useful to isolate the problem area after overriding the +5V protection. Determine whether:

1. The +5V source is working properly; isolate coil 5430 and jumper 9044 and measure the +5V
2. ITT sound processor circuit is loading the +5V; isolate coil 5430
3. The tuner is loading the +5V source; isolate jumper 9044
4. Main tuner circuit is loading the +5V source; isolate coil 5261

Caution! Overriding the 5V protection when there is a 5V failure can increase the temperature in the set and may cause permanent damage to components. Do not override the 5V protection for a prolonged time.
Error 5 = Reserved
Error 6 = General $I^2C$ error. This will occur in the following cases:

- SCL or SDA is shorted to ground
- SCL is shorted to SDA
- SDA or SCL connection at the micro controller is open circuit.

Error 7 = BC-loop not stabilised ( BCF = 1 ) Black current loop instability protection. The possible cause could be a defect in one or more of the RGB amplifiers, RGB guns or RGB driving signals.
Error 8 = BOCMA IC TDA888xx $I^2C$ communication failure. BOCMA ( item 7301 on SSB ) is corrupted or the $I^2C$ line to the BOCMA is low or no supply voltage present at pin 14 and/or pin 60 (3V3)
Error 9 = BOCMA IC TDA888xx 8V failure ( SUP bit ). No supply voltage at pin 53. Check NFR 3331 and coil 5333.
Error 10 =NVM $I^2C$ error. NV memory (EEPROM - item 7066) does not respond to the micro controller.
Error 11 = micro controller / NV Memory identification error. During the last start-up the NVM and the micro controller did not recognize each other (e.g. one of them was replaced or the NVM memory has been changed/adapted or lost), therefore the NVM was loaded with default values.
Error 12 = Microprocessor ( Painter - item 7064) internal RAM test failure.
Error 13 =Main Tuner $I^2C$ failure UV13xx. Tuner ( item 1225 ) is corrupted or the $I^2C$ line to the Tuner is low or not supply votage at pin 9, pin 6 or 7 of the tuner.
Error 14 =Sound processor $I^2C$ error (MSP34xx - ). Sound controller MSP3400 or MSP3410 does not respond to the micro controller.
Error 15 =SRAM IC uPD431000A-B test failure ( item - 7070 ).
Error 16 =PIP/DW Tuner $I^2C$ error. The Tuner ( TEDE9 - item 1900 ) on the PIP-panel does not respond to the micro controller.
Error 17 = PIP IC M65669SP $I^2C$ failure ( item 7803 ) or Double Window IC SAB9081 $I^2C$ failure.
Error18 = I/O expander IC 62320P $I^2C$ failure ( item 7910 on PIP panel ).
Error 19 = Guide+ $I^2C$ failure ( LC27016B - item 7005 ). USA only.
Error 20 = V-chip for PIP, IC ZiLOG 86130 $I^2C$ failure USA only.
Error 21 = NV clock IC MK41T56 $I^2C$ failure at mono board - Item 7011 at A7.
Error 22 = Reserved.
Error 23 = Second BOCMA IC TDA888xx ( on DW panel ) $I^2C$ communication failure.
Error 24/29 = Reserved.

– Error codes 1,2, and 4 are protection codes and in this case supplies of some circuits will be switched off. Also in protection, the LED will blink the number of times equivalent to the most recent error code.

### 5.3.3 Error code table

| Error code | Error description | Possible defective components |
|---|---|---|
| 0 | No error detected | - |
| 1 | X-ray protection/ EW and/or High beam protection active | LOT, Line deflection circuit, EW-circuit or CRT amplifier circuit, picture tube or +200V missing |
| 2 | Vertical protection | Vertical circuit is defective |
| 3 | Reserved | |
| 4 | 5V protection active | +5V supply line is low or short circuit |
| 5 | Reserved | |
| 6 | General $I^2C$ bus error | $I^2C$ bus s/c or o/c on uP |
| 7 | BC-loop not stabilised | RGB amplifiers, RGB guns or RGB driving signals of BOCMA |
| 8 | BOCMA $I^2C$ error | IC 7301 |
| 9 | BOCMA 8V supply failure | IC 7301 and R3331 |
| 10 | NVM $I^2C$ error | IC7066 |
| 11 | NVM identification failure | IC7066 |
| 12 | uProcessor internal RAM test failure | IC 7064 |
| 13 | Main Tuner $I^2C$ error | IC 1225 - UV13xx |
| 14 | Sound processor $I^2C$ error | IC 7 (2CS/Nicam) |
| 15 | SRAM $I^2C$ error | IC 7070 |
| 16 | PIP tuner $I^2C$ error | IC 1900 - TEDE9 |
| 17 | PIP IC $I^2C$ error or DW IC $I^2C$ error | IC M656695P or IC SAB9081 |
| 18 | I/O expander IC 62320P $I^2C$ error | IC 62320P - item 7910 |
| 19 | Guide+ $I^2C$ error | IC LC27016B - item 7005 |
| 20 | V-chip for PIP - $I^2C$ error | IC ZILOG 86130 - |
| 21 | NV clock - $I^2C$ error | IC MK41T56 - item 7011 |
| 22 | Reserved | |
| 23 | Second BOCMA IC on DW panel - $I^2C$ error | IC TDA888xx - item |

## 5.4 The "blinking LED" procedure

The contents of the error buffer can also be made visible through the "blinking LED" procedure. This is especially useful when there is no picture.

– When the SDM is entered, the LED will blink the number of times, equal to the value of the error code.

When the SDM is entered, the LED will blink the contents of the error-buffer. Error-codes ≥ 10 are shown as followed. A long blink of 750 msec. which is an indication of the decimal digit, followed by a pause of 1500 msec. followed by n short blinks. When all the error-codes are displayed, the sequence is finished with a LED display of 3 seconds. The sequence starts again.

Example:

Error code position 1 2 3 4 5

Error buffer: 12 9 6 0 0

- after entering SDM: 1 long blink of 750 msec. + pause of 1500 msec + 2 short blinks - pause of 3 sec. - 9 short blinks - pause of 3 sec. - 6 short blinks - pause of 3 sec. - long blink of 3 sec. -- etc.

NOTE: If errors 1, 2 or 4 occurs the LED ALWAYS blinks the last occurred error, even if the set in NOT in service mode.

## 5.5 TROUBLE SHOOTING TIPS

In this paragraph some trouble shooting tips for the deflection and power supply circuitry are described. For detailed diagnostics, check the fault finding tree.

### 5.5.1 THE DEFLECTION CIRCUIT:

– Measure if the VBAT (140V) is present across 2939/2940 (A1 POWER SUPPLY). If the voltage is not present, disconnect jumper 9936 and 9937 ( see A1 Power Supply) The whole Line Deflection stage is now disconnected. If the voltage is present then the problem might be caused by the deflection circuit. Possibilities:
  – Transistor 7410 is defective
  – The driver circuit around transistor 7481 is faulty
  – No horizontal drive signal coming from the BOCMA IC 7301 pin 56 on the SSB

1. Note: If the C and E of 7410 are shorted, hick-up noise can be heard from the power supply circuit.
2. To determine whether the fault is present in the line deflection circuit (A2 LINE DEFLECTION) or in the EW circuit/panel (screen size above 21"), insert jumper into position numbers 9409 (in this case the EW protection is disabled). If the basic deflection is working (picture is parabolic distorted), then the fault is located in the EW circuit/panel. If there is no hor. deflection, the fault is present in the basic deflection circuitry.
3. Also take note of protection circuits in the line output stage. If any of these circuits are activated, the set will shut down. Depending on protections, the LED will blink according to the fault defined. In order to determine which protection circuit is active, isolation of circuits is necessary. These protection circuits are:
4. High beam protection. See error 1 - IBeam.
5. X-ray protection : See error 1

If the high beam protection or the X-ray protection is active, it will switch the set to protection and the SDM is activated. The service LED blinks repetitively 1 time. If this happen, isolate each circuit to determine the cause

### 5.5.2 THE POWER SUPPLY.

To trouble shoot the A10 SMPS, first check the +5V_STBY voltage on IC7968, pin 3/4. If this voltage is not present, check fuse 1961 and D6961. If 1906 or D6917 is not open circuit, the problem might be caused on the primary side of the switching supply. Check the output of the bridge diodes on the cathode side of D6912/D6913 or D6915 - pin 1 for approximately 300V DC. If this voltage is missing, check the bridge diodes and the fuse. If fuse F1900 is found open, check IC7921 (circuit A1) between pins 3 and 2 to make sure that there is no short circuit present. If the 300V DC is present on pin 3 of IC7902, check for a startup voltage of 16V on pin 4 of IC7921. If startup voltage is not present, check if R3914 is open; a short circuit between pin 4 and 5 will also cause this problem. It is necessary to have a feedback signal from the hot secondary side of switch mode transformer T5912 at pin 8 and pin 9 for the power supply to oscillate. If this startup voltage is present on pin 4 of IC7902 and the supply is not oscillating, check R3929 and D6929.

The A10 power supply has been designed with Over Voltage Protection (OVP). To determined whether OVP is active, check whether VBAT - 141V is present at IC7971 pin 1. If not, check the components D6938, C2939 and C2940 and L5941. If these components are O.K., then check voltage at pin 3 of IC 7942. If this voltage is not present check fuse 1941 and fuse 1942. Replace if necessary. If dc-voltage is present at pin 3, replace opto-coupler 7929.

Another way to confirm whether OVP is active, is to measure the voltage with an oscilloscope at IC7902 pin 4. If the voltage is fluctuating between 11-14V, then check the components as described in the above mentioned paragraph.

## 5.6 Customer Service Mode (CSM)

All A10.0 sets are equipped with the "Customer Service Mode" (CSM). CSM is a special service mode that can be activated and deactivated by the customer, upon request of the service technician/dealer during a telephone conversation in order to identify the status of the set. This CSM is a 'read only' mode, therefore modifications in this mode are not possible.

### 5.6.1 Entering the Customer Service Mode.

The Customer Service Mode can be switched on:

– by pressing simultaneously the button (MUTE) on the remote control and any key on the control buttons (P+, P-, VOL +, VOL -) on the TV for at least 4 seconds.

When the CSM is activated:

- picture and sound settings are set to nominal levels
- modes that interfere with the behaviour of the set are switched off (sleep timer, auto standby, etc.)

### 5.6.2 Exit the Customer Service Mode.

The Customer Service Mode will be switched off after:

– pressing any key on the remote control handset (except "P+" or "P-")
– switching off the TV set with the mains switch.

All settings that were changed at activation of CSM are set back to the initial values

### 5.6.3 The Customer Service Mode information screen

After switching on the Customer Service Mode the following screen will appear.

## CSM Menu

```
                                                    CSM
1   HRS: 0005 SWID: A10EU1-2.7
2   CODES: 0 0 0 0 0 0 0
3   OPT: 254 100 128 0 0 0 0 0
4   SYSTEM: EUROPE      11 SOUND: MONO
5   NO SIGNAL           12 VOLUME:          ...
6                       13 BALANCE: +/-     ...
7                       14 HUE:     +/-     ...
8                       15 COLOUR:          ...
9                       16 BRIGHTNESS:      ...
10  SOURCE: 1           17 CONTRAST:        ...
```

CL 06532012_010.eps
070200

**Figure 5-3**

The Customer Service Menu shows the following information:
– Line 1 : "HRS : nnnnn" and SWID : "A10BBC-X.Y"
HRS : Hexadecimal counter of operating hours. (Standby hours are not counted as operating hours) .
SWID : (Software identification of the main micro controller ) See paragraph 5.2. Details on available software versions can be found in the chapter "Software Survey" of the publication "Product Survey - Colour Television".
– Line 2 : "CODES : xx xx xx xx xx xx xx "
Error code buffer (see paragraph 5.3). Displays the last 7 errors of the error code buffer.
– Line 3 : "OPT xxx xxx xxx xxx xxx xxx xxx xxx"
Option bytes. Software and hardware functionality of the A10.0 is controlled by option bits. An option byte or option number represents 8 of those bits. Each option number is displayed as a decimal number between 0 and 255. The set may not work correctly when an incorrect option code is set. See chapter 8 for more information on correct option settings
– Line 4: "SYSTEM : EUROPE"
Indicates which colour and sound system is installed for this preset:
– PAL BG
– PAL I
– PAL DK
– SECAM BG
– SECAM DK
– SECAM LL'
Complaints that may be caused by an incorrect system setting:
- no colours
- colours not correct
- unstable picture
- noise in picture

To change the system setting of a preset:
1. press the "MENU" button on the remote control
2. select the INSTALL sub menu
3. select the MANUAL STORE sub menu
4. select and change the SYSTEM setting until picture and sound are correct
5. select the STORE menu item

– Line 5 : "NO SIGNAL"
Indicates that the set is not receiving an "ident" signal on the selected source.
- no or bad antenna signal; connect a proper antenna signal
- antenna not connected; connect the antenna
- no channel / preset is stored at this program number; go to the INSTALL menu and store a proper channel at this program number
- the tuner is faulty (in this case the CODES line will contain number 13 or 16); check the tuner and replace/repair if necessary

Note: On some models, BLUE MUTE is displayed (if the BM option is ON) when no signal is received.
– Line 6 : "TIMER ON "
Indicates that the on/off timer is running. Complaints that may be caused by the activation of the sleep timer.
Without using the remote control of the local keybpard the set is switching:
- on from standby:
- to a different channel

To switch off the activation timer:
1. select "TIMER" in the "FEATURE" menu
2. select "ACTIVATE' in the "TIMER" menu
3. set to "OFF" with the left/right cursor keys

– Line 7 : "CHANNEL BLOCKED"
Indicates that all channels are locked except the selected channel. Complaint that may be caused by locked channels:
– TV cannot be switched on from standby with the local keyboard buttons
– "P+" and "P-" buttons on local keyboard do not function

To disable the LOCK feature:
1. select "FEATURE" menu (with the Remote Control)
2. select "LOCK" (with the RC)
3. set to "OFF"

– Line 8 : "NOT PREFERED"
Indicates that at least one channel is deleted as a preferred channel (by default, all channels are skipped. Note that "SKIPPED" will always be displayed in CSM unless all the channels are not skipped. A channel can be added as a selected channel to the list of preferred channels:
1. select "INSTALL" menu
2. select "CHANNEL EDIT"
3. select "ADD/DELETE"
4. set to "ADD" with the left/right cursor keys

– Line 9 : "HOTEL MODE ON"
Inidcates that the Hotel mode has been activated.
– Line 10 : "SOURCE"
Indicates which SOURCE is installed for this preset.
EXT1, SVHS2, EXT2, Tuner.
– Line 11 : "SOUND"
Inicates which sound mode is installed for this preset.
Mono, NICAM, Stereo, L1, L2, SAP, Virtual and Digital
– Line 12 : "VOLUME"
Value indicates level at entry CSM.
– Line 13 : "BALANCE"
Value indicates level at entry CSM.
– Line 14 : "HUE"
Value indicates level at entry CSM.
– Line 15 : "COLOR"
Value indicates level at entry CSM.
– Line 16 : "BRIGHTNESS"
Value indicates level at entry CSM.
– Line 17 : "CONTRAST"
Value indicates level at entry CSM.

### 5.6.4 Solving other problems

TV switched off or changed channel without any user action
Set switches off after "TV SWITCHING OFF" was displayed
Auto standby switched the set off because:
- there was no ident signal for more than 15 minutes
- there was no remote control signal received or local key pressed for > 2 hours

See chapter 8 for a description on the options to enable/disable auto standby

***Picture problems***

***Picture too dark or too bright***
– Press "Smart Picture" button on the remote control. In case the picture improves, increase / decrease the brightness value or increase / decrease the contrast value. The new "Personal Preference" value is automatically stored after 3 minutes
– After switching on the Customer Service Mode the picture is OK. Increase / decrease the brightness value or increase / decrease the contrast value. The new "Personal Preference" value is automatically stored after 3 minutes

***White line around picture elements and text***

- press "Smart Picture" button on the remote control. In case the picture improves, decrease the sharpness value. The new "Personal Preference" value is automatically stored after 3 minutes
- after switching on the Customer Service Mode the picture is OK. Decrease the sharpness value. The new "Personal Preference" value is automatically stored after 3 minutes

***Snowy picture***

- check the "NOT TUNED" section of the Customer Service Mode screen

***Snowy picture and/or unstable picture***

- a scrambled or decoded signal is received

***Black and white picture***

- press "Smart Picture" button on the remote control. In case picture improves, increase the colour value. The new "Personal Preference" value is automatically stored after 3 minutes
- after switching on the Customer Service Mode the picture is OK. Increase the colour value. The new "Personal Preference" value is automatically stored after 3 minutes

***Menu text not sharp enough***

- press "Smart Picture" button on the remote control. In case the picture improves, decrease the contrast value. The new "Personal Preference" value is automatically stored after 3 minutes
- after switching on the Customer Service Mode the picture is OK. Decrease the contrast value. The new "Personal Preference" value is automatically stored after 3 minutes

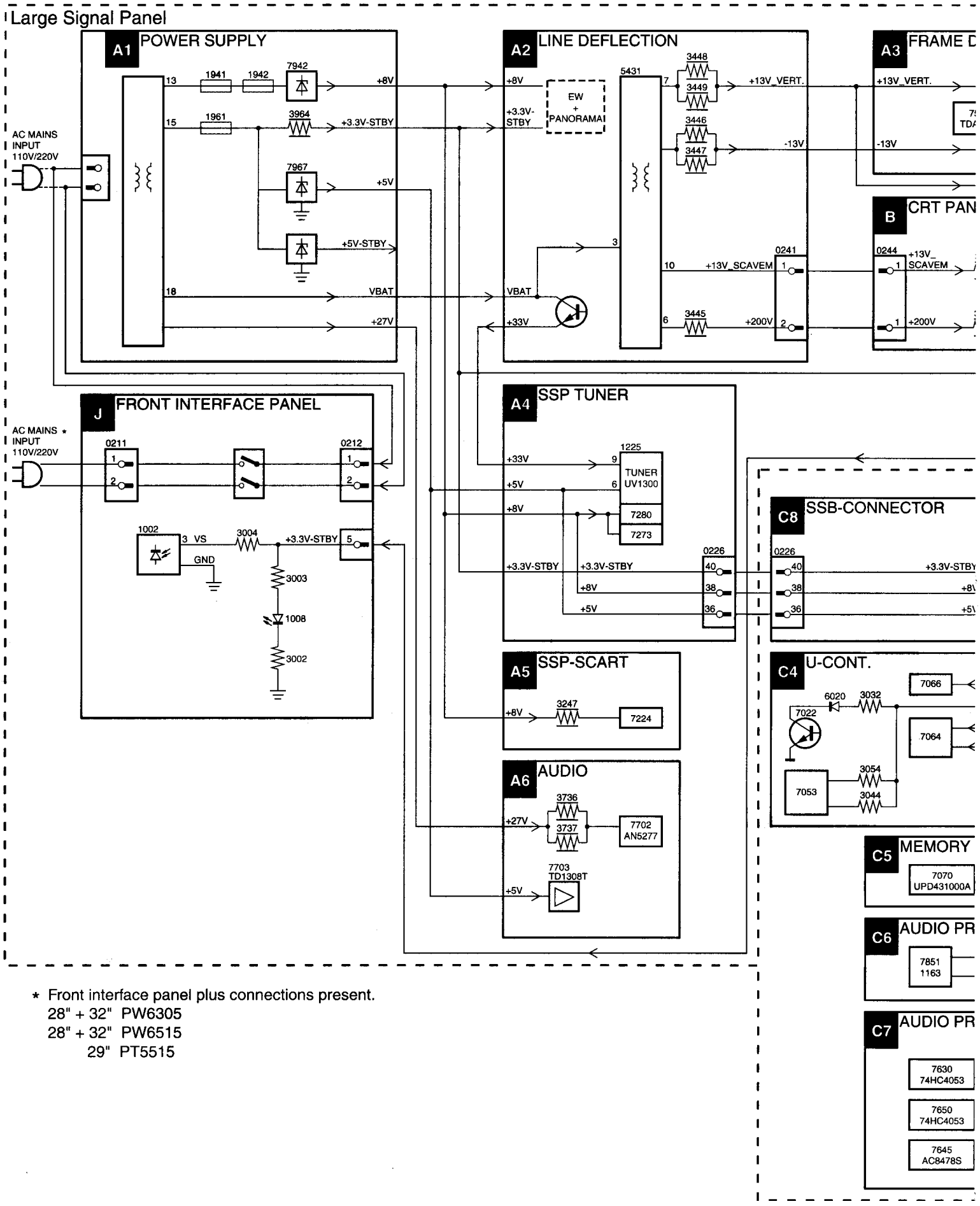
***Sound problems***

No sound or sound too loud (after channel change / switching on)

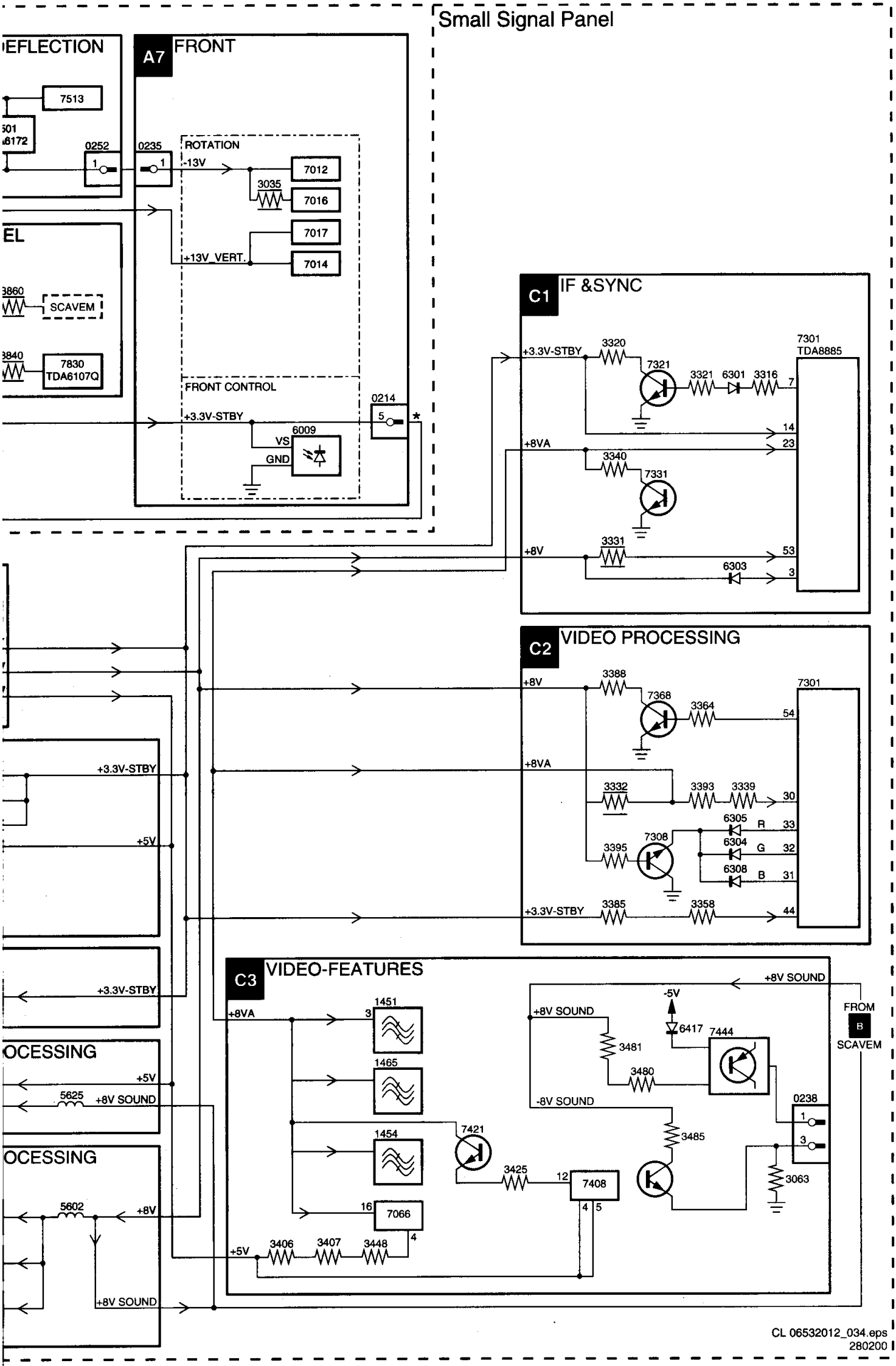
- after switching on the Customer Service Mode the volume is OK. Increase / decrease the volume level. The new "Personal Preference" value is automatically stored after 3 minutes

# 6. Blockdiagram, supply diagram and testpointsoverviews.

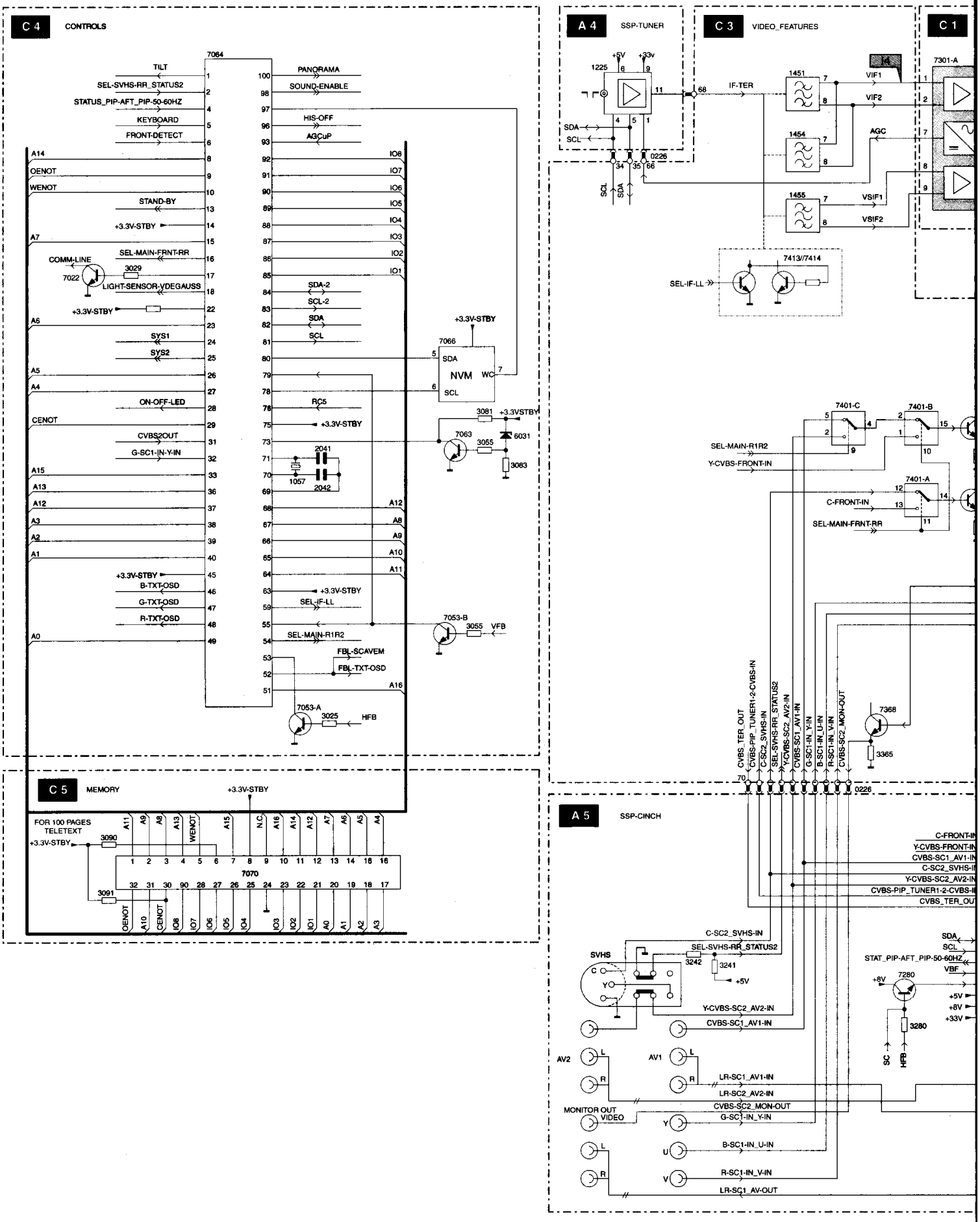
## Supply voltage diagram

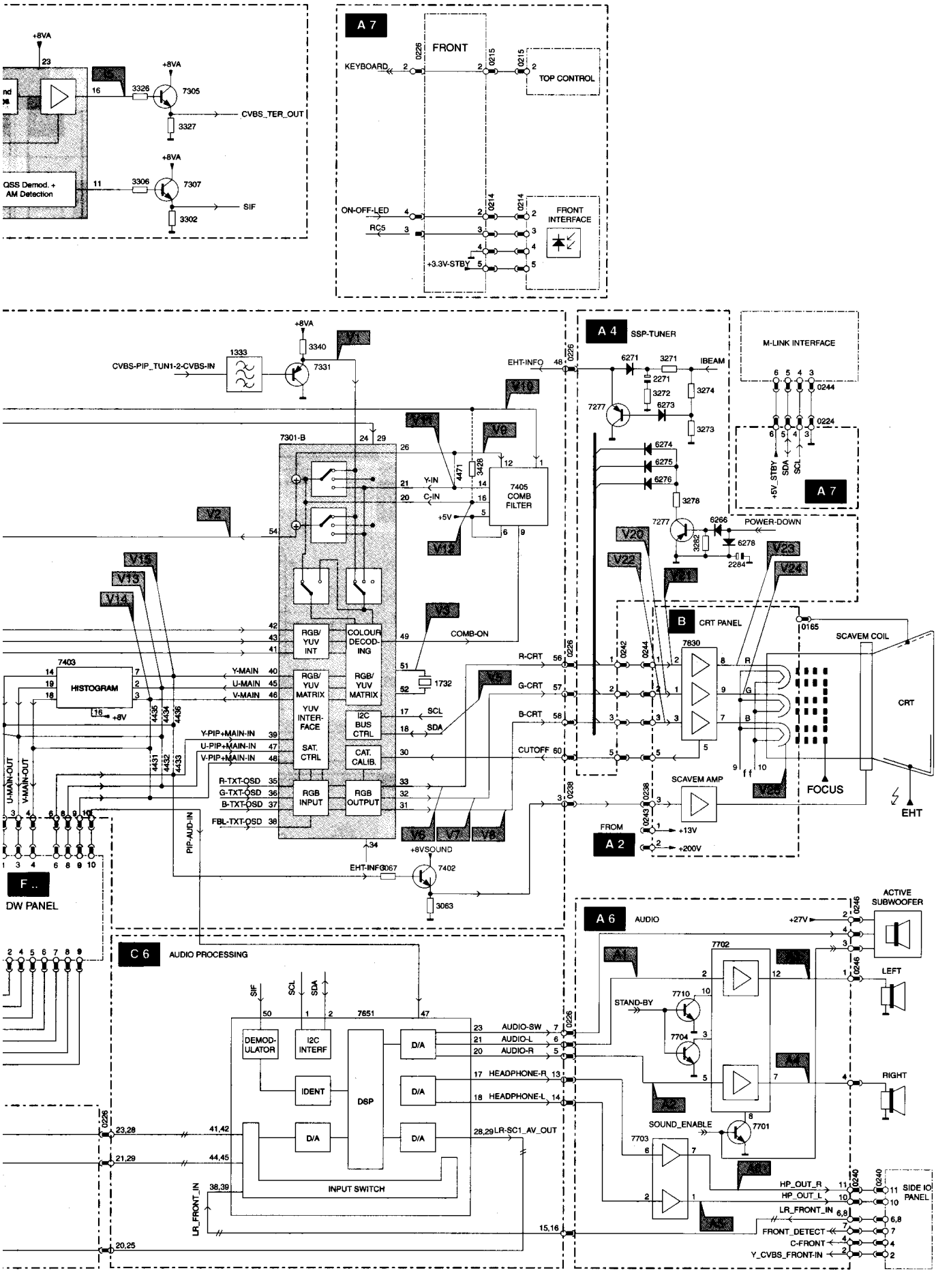



* Front interface panel plus connections present.
28" + 32" PW6305
28" + 32" PW6515
29" PT5515


Small Signal Panel
EFLECTION
7513
0252
A7 FRONT
0235
ROTATION
-13V
7012
3035
7016
7017
+13V_VERT.
7014
EL
3860
SCAVEM
3840
7830
TDA6107Q
FRONT CONTROL
0214
+3.3V-STBY
6009
VS
GND
C1 IF &SYNC
+3.3V-STBY
3320
7321
3321
6301
3316
7301
TDA8885
+8VA
3340
7331
+8V
3331
6303
C2 VIDEO PROCESSING
3388
7368
3364
3332
3393
3339
6305
R
6304
G
6308
B
7308
3395
3385
3358
C3 VIDEO-FEATURES
+8V SOUND
-5V
6417
7444
3481
3480
FROM
B
SCAVEM
1451
1465
1454
7421
3425
7408
3485
0238
3063
7066
3406
3407
3448
5625
5602
CL 06532012_034.eps
280200

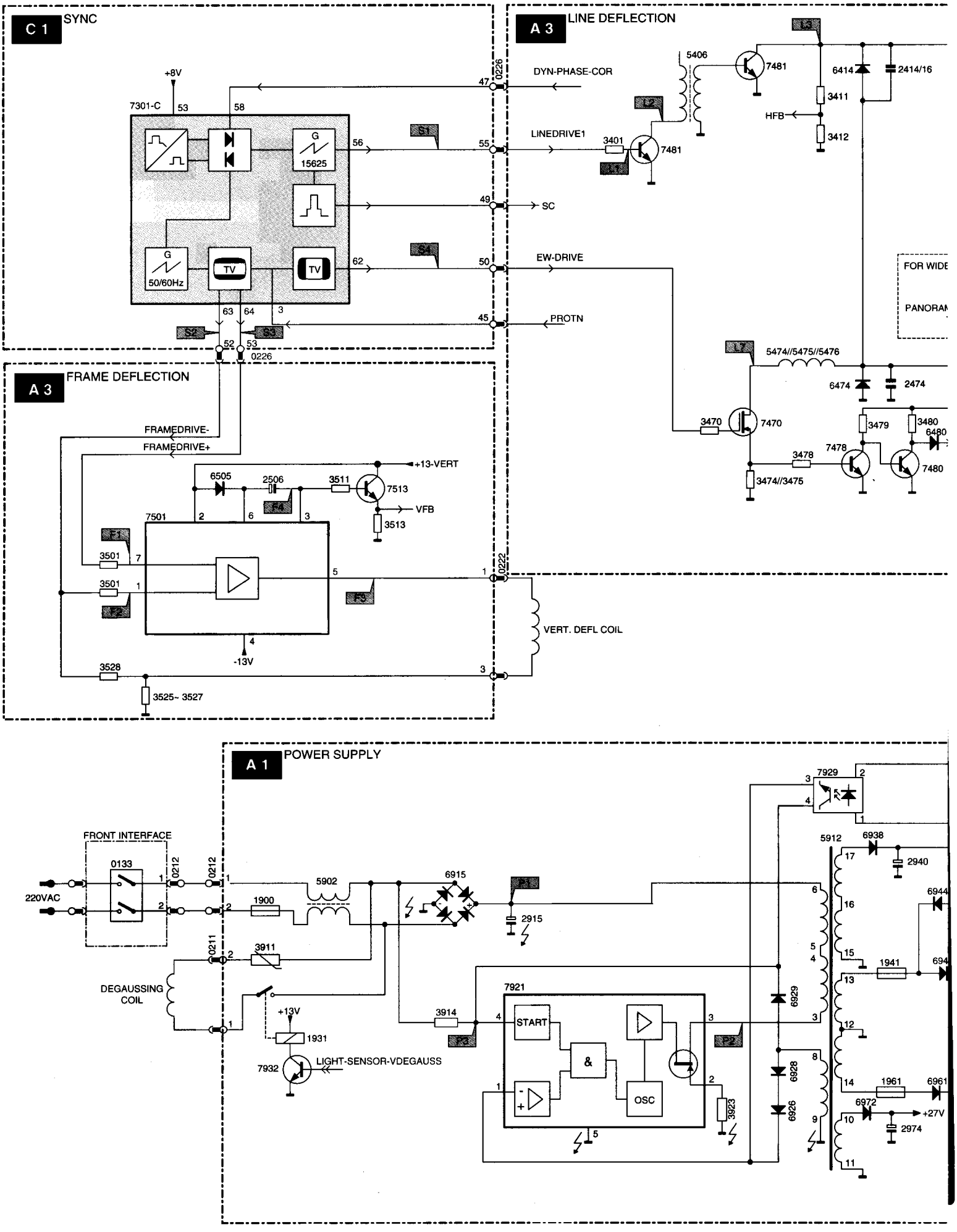
# Blockdiagram

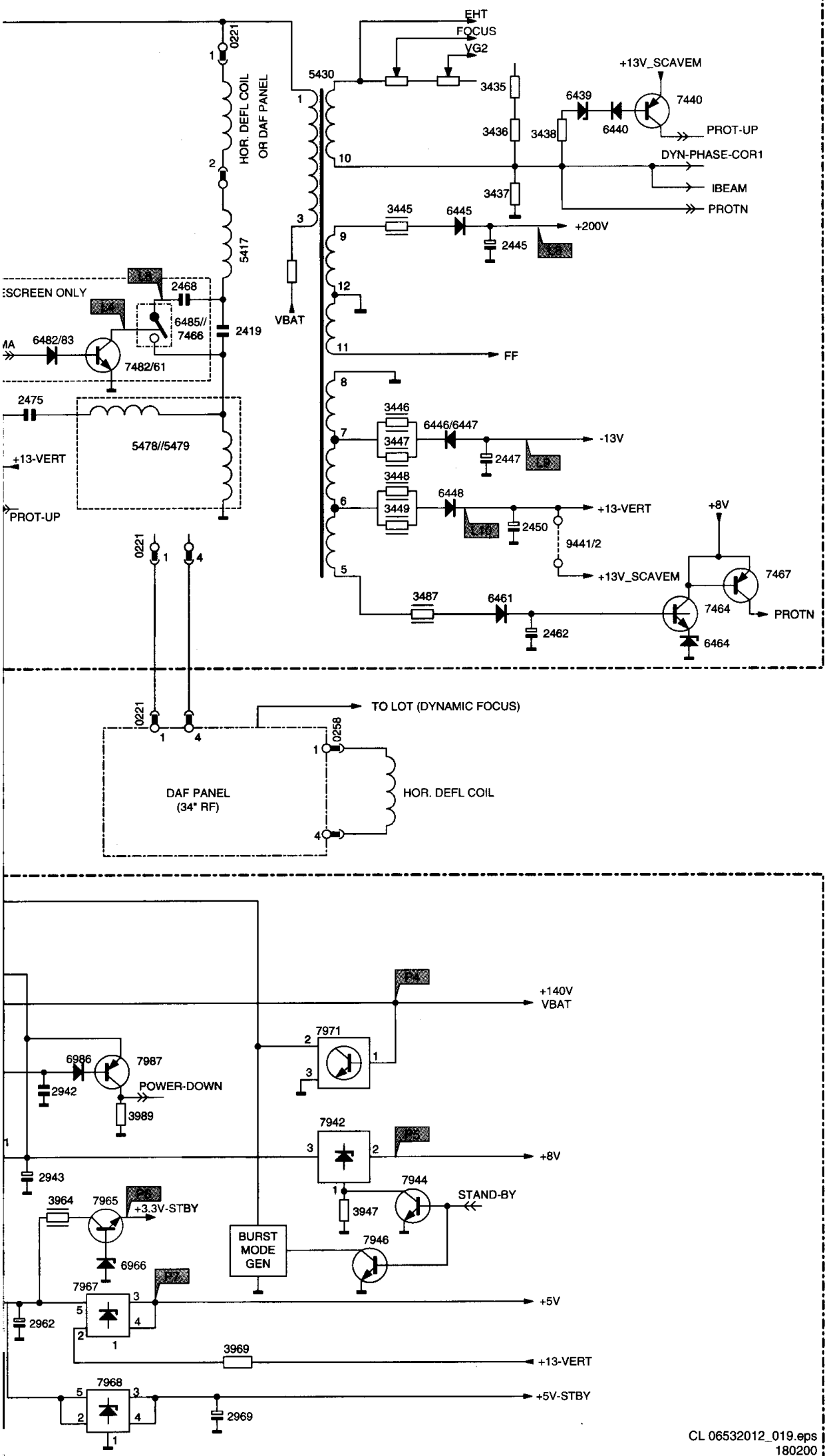




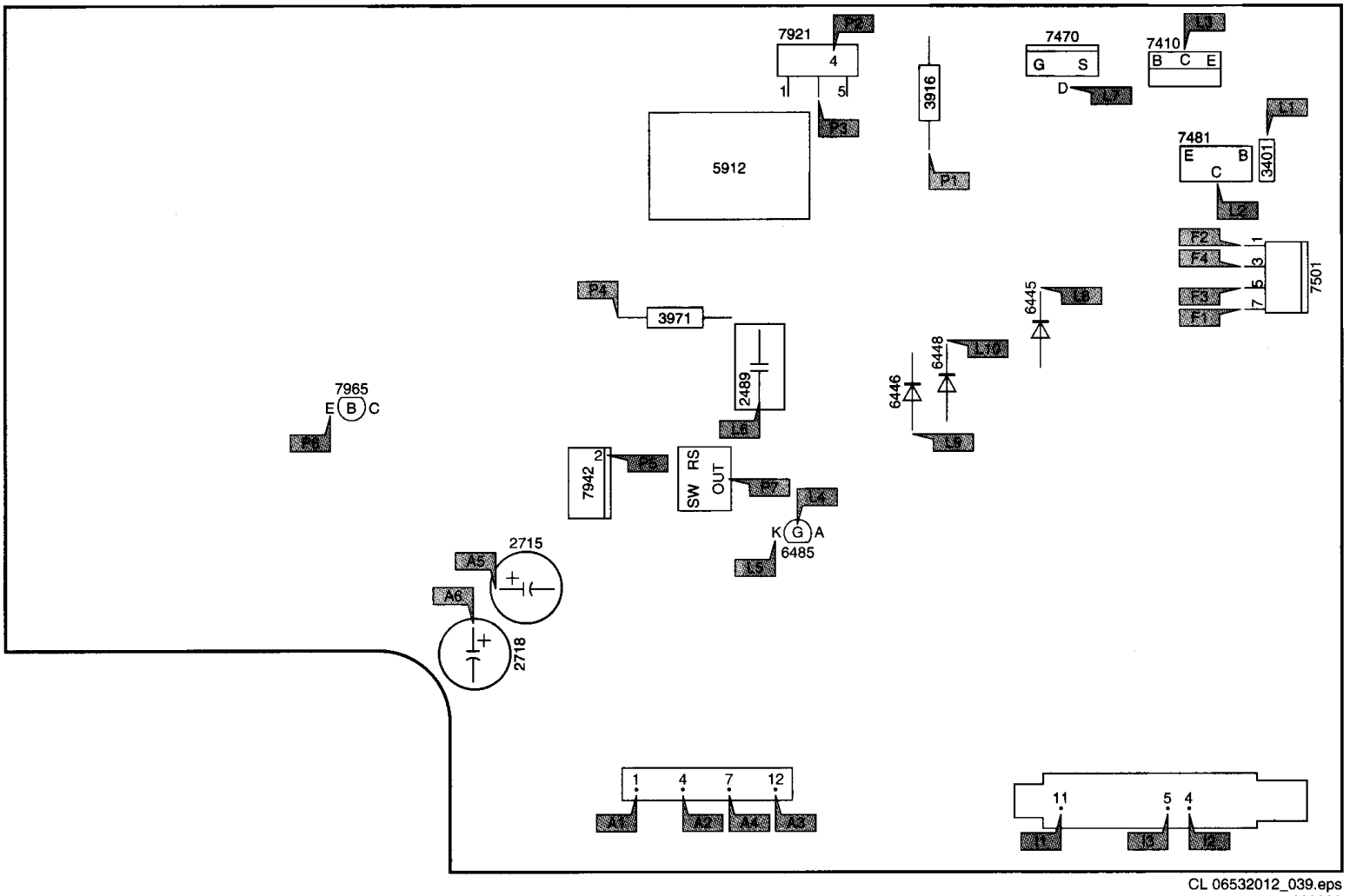

CL 06532012_018.eps
040200

## Blockdiagram



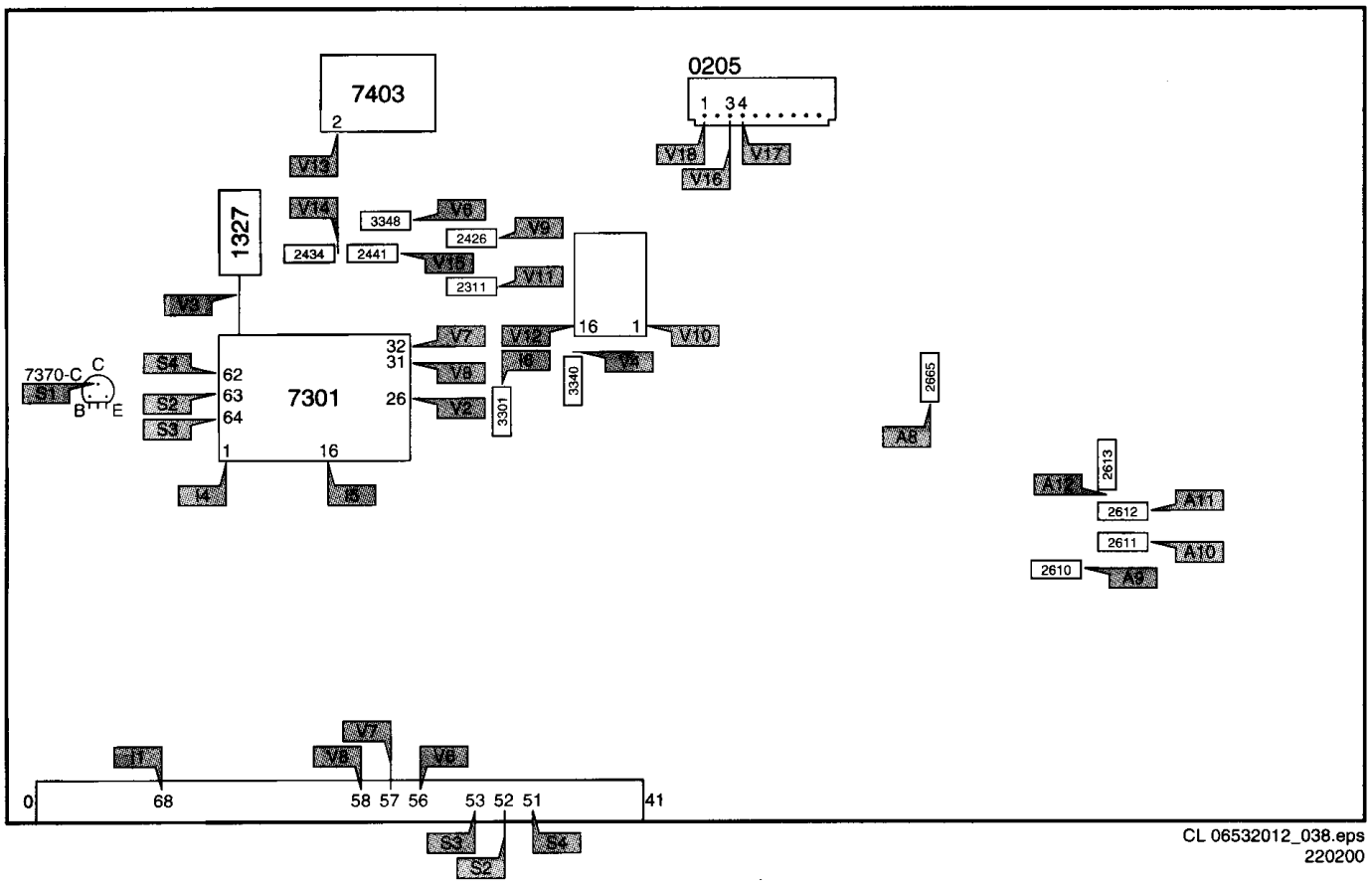

EHT
FOCUS
VG2
0221
HOR. DEFL COIL
OR DAF PANEL
5430
3435
3436
3438
3437
6439
6440
7440
+13V_SCAVEM
PROT-UP
DYN-PHASE-COR1
IBEAM
PROTN
3445
6445
+200V
2445
5417
2468
6485//
7466
2419
6482/83
7482/61
SCREEN ONLY
VBAT
FF
2475
5478//5479
+13-VERT
PROT-UP
3446
3447
6446/6447
-13V
2447
3448
3449
6448
+13-VERT
2450
9441/2
+8V
7467
+13V_SCAVEM
7464
PROTN
6464
3487
6461
2462
TO LOT (DYNAMIC FOCUS)
0258
DAF PANEL
(34" RF)
HOR. DEFL COIL
+140V
VBAT
7971
6986
7987
POWER-DOWN
2942
3989
7942
+8V
2943
3964
7965
+3.3V-STBY
6966
7944
STAND-BY
3947
BURST
MODE
GEN
7946
7967
+5V
2962
3969
+13-VERT
7968
+5V-STBY
2969
CL 06532012_019.eps
180200

## Testpointoverview LSP (comp.side)



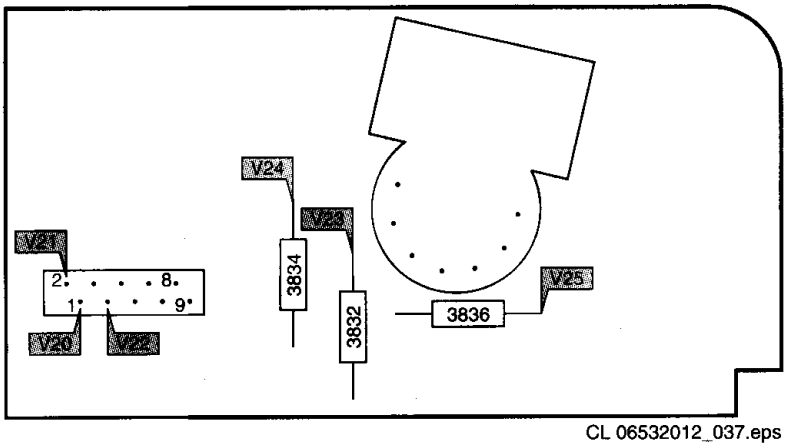

CL 06532012_039.eps
220200

## Testpointoverview SSB (comp.side)



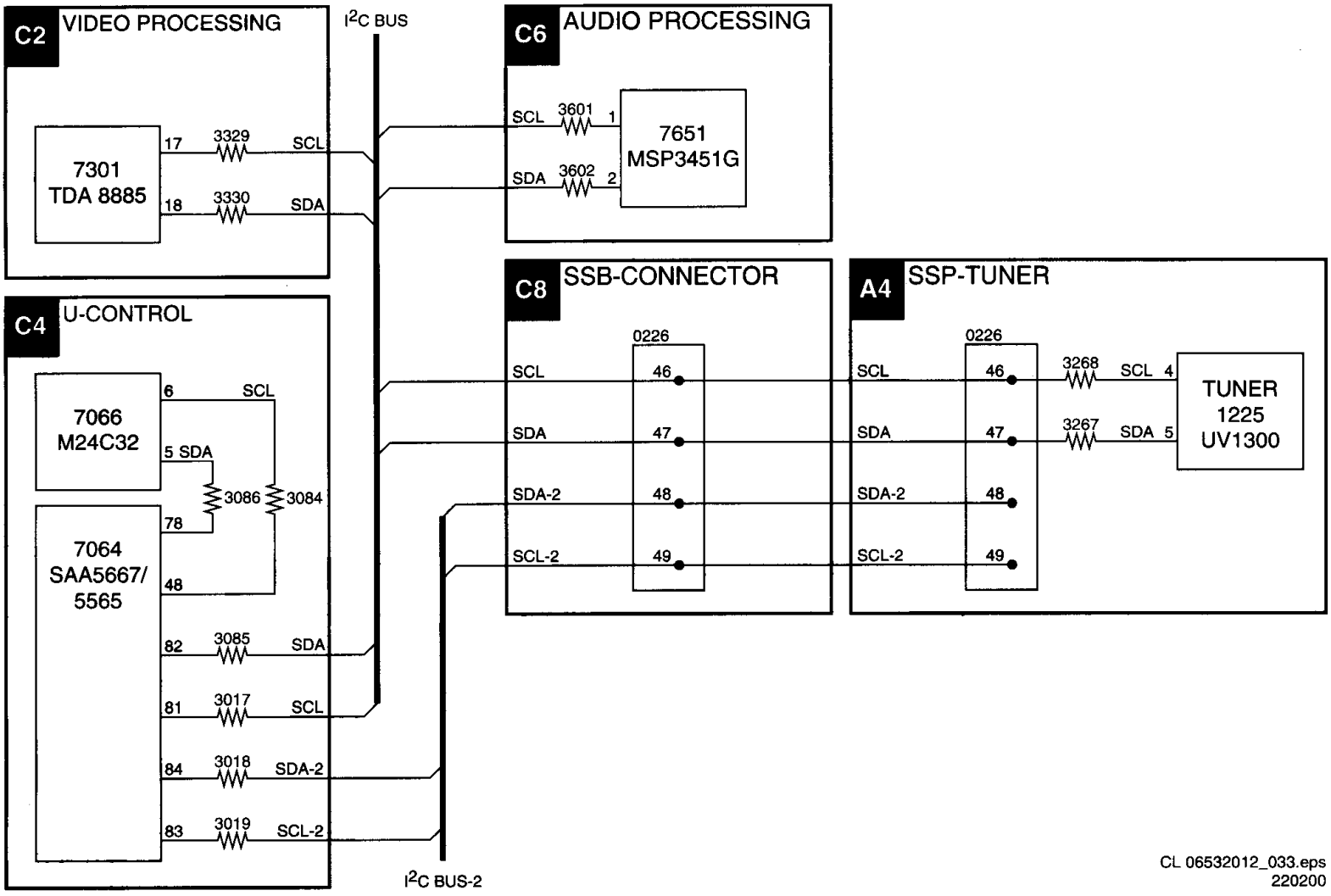

CL 06532012_038.eps
220200

# Testpointoverview CRT (comp.side)




CL 06532012_037.eps
220200

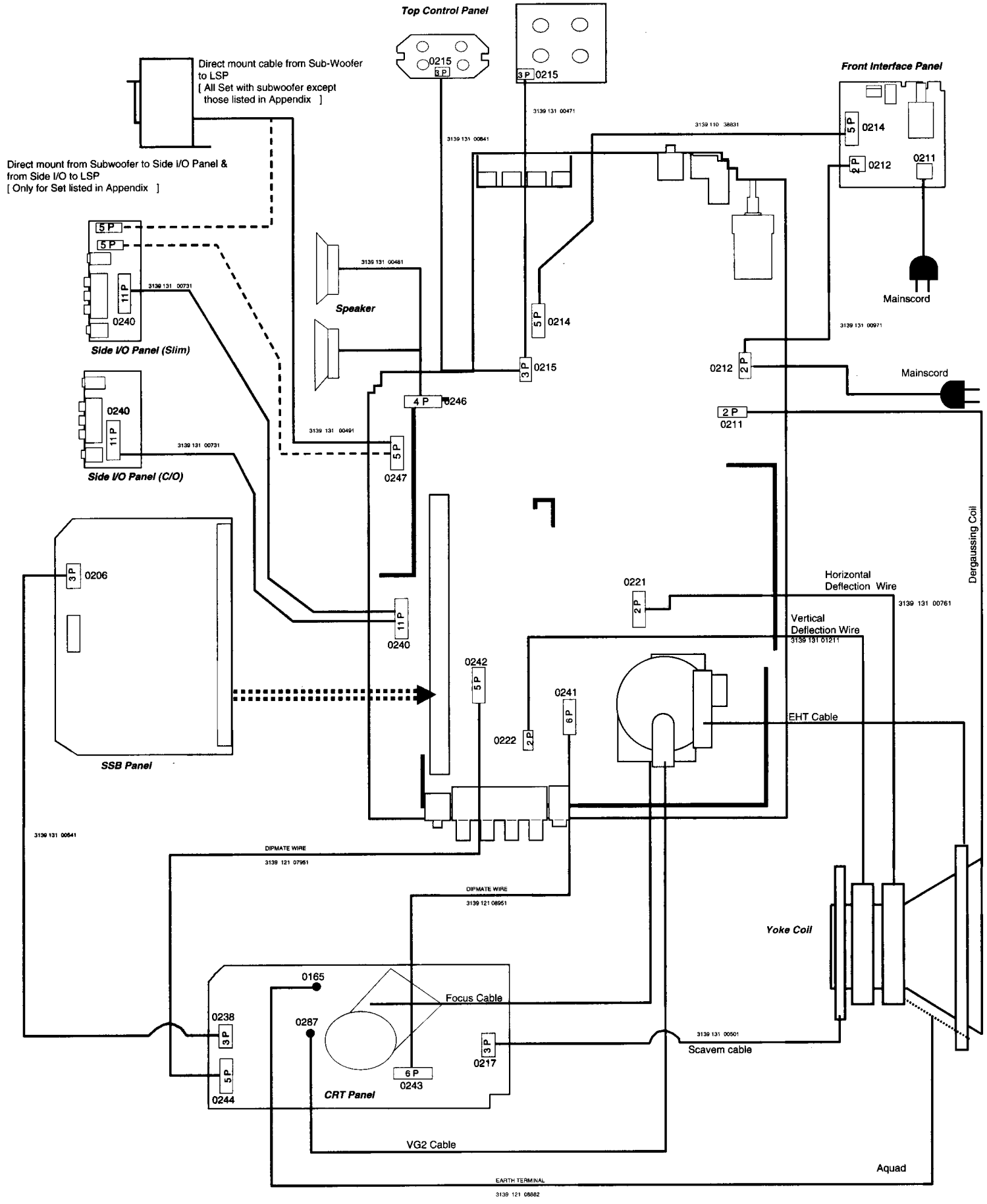
# IC overview




CL 06532012_033.eps
220200

## Wiringdiagram

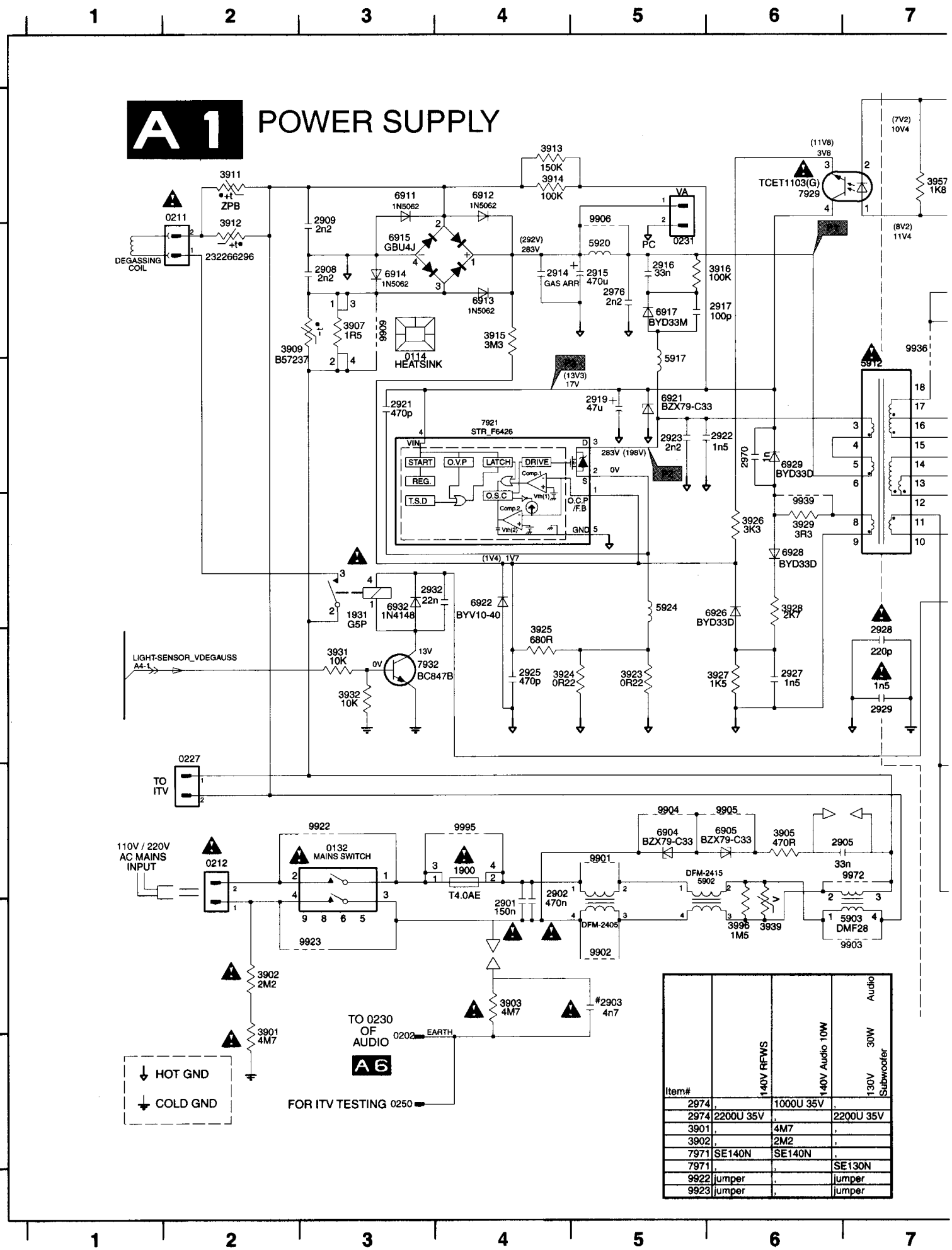
# A10 - Wire Diagram ( Basic Configuration )



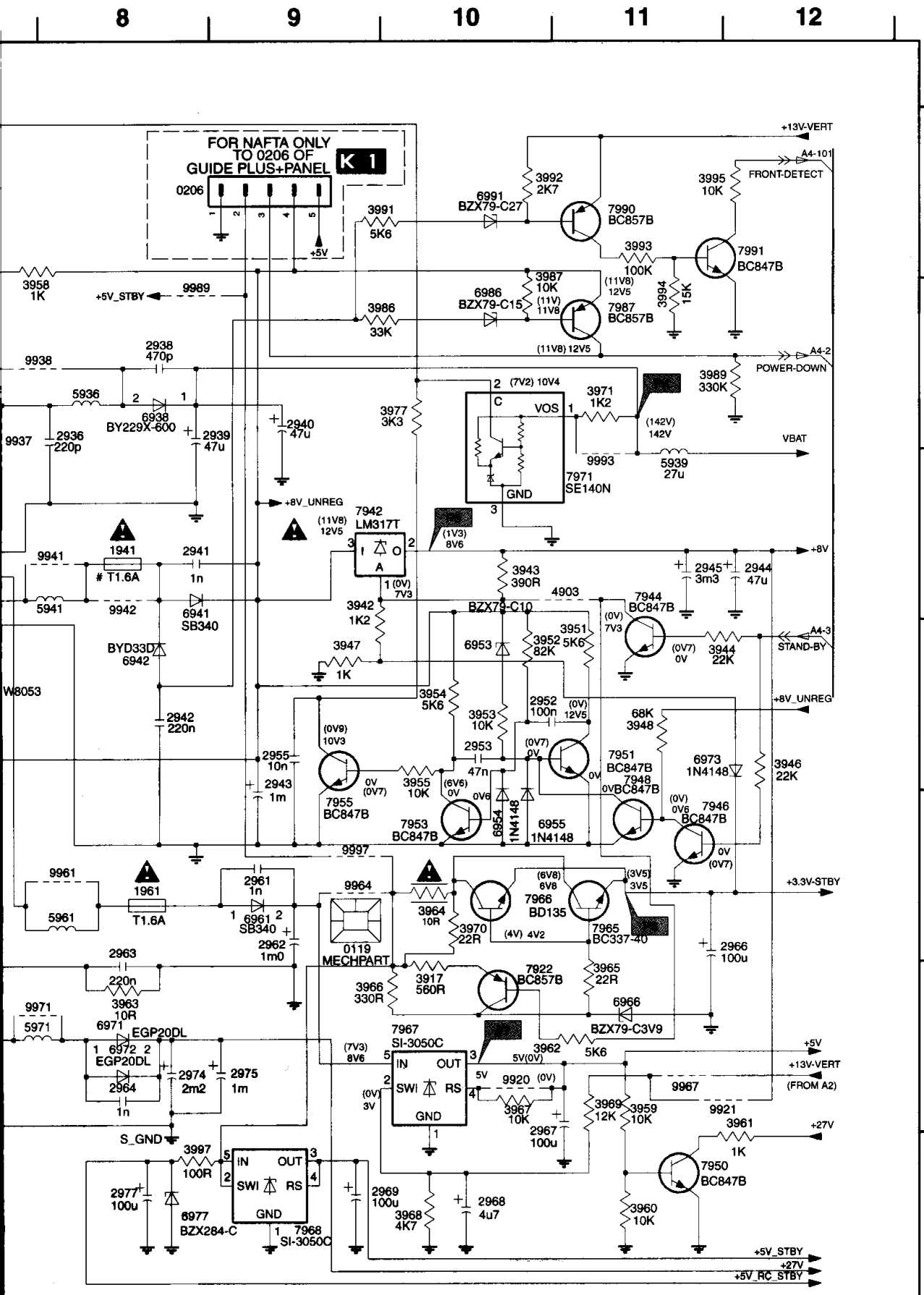

CL 06532012_017.eps
040200

# 7. Schematics and PWB's

## Power supply

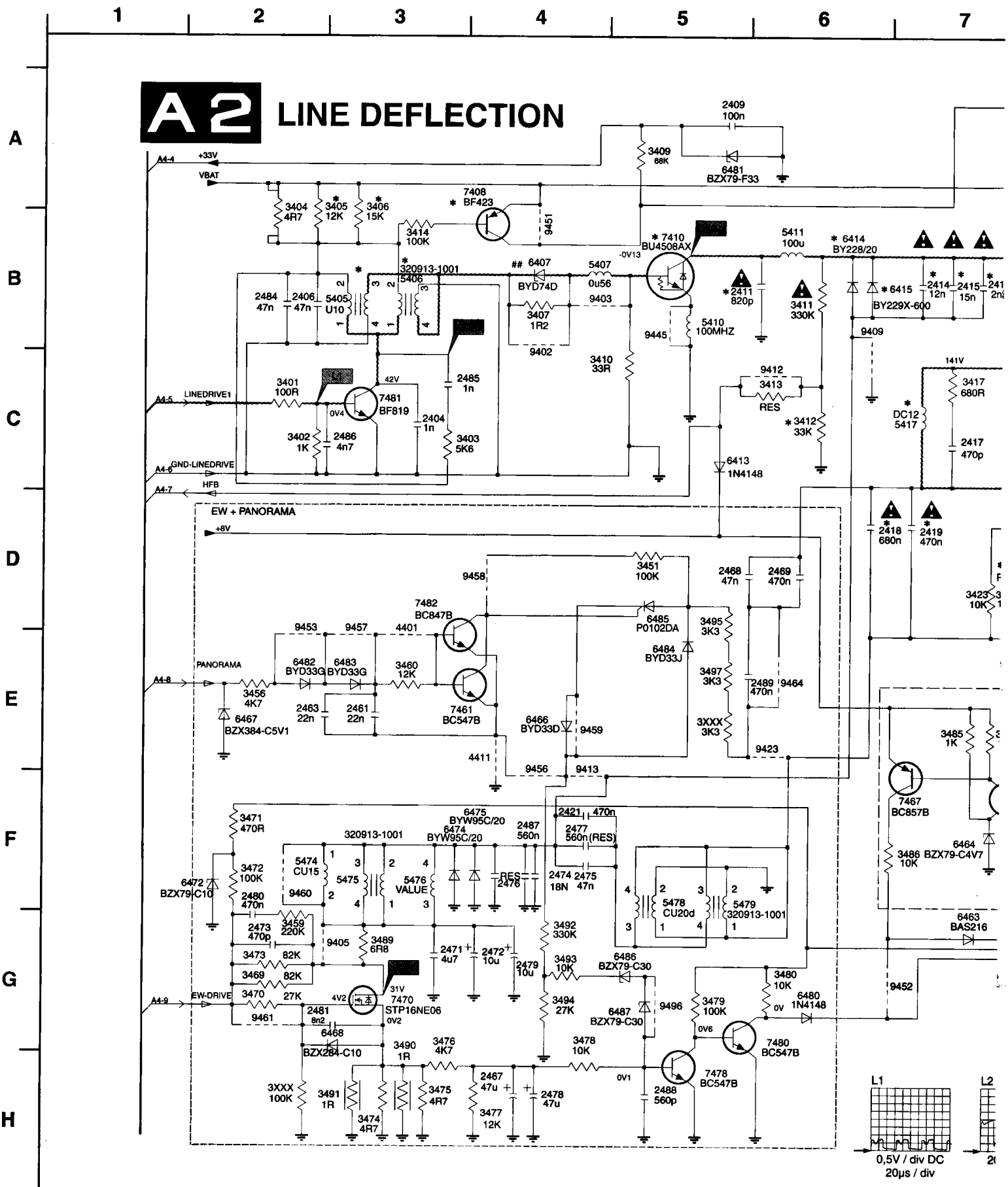


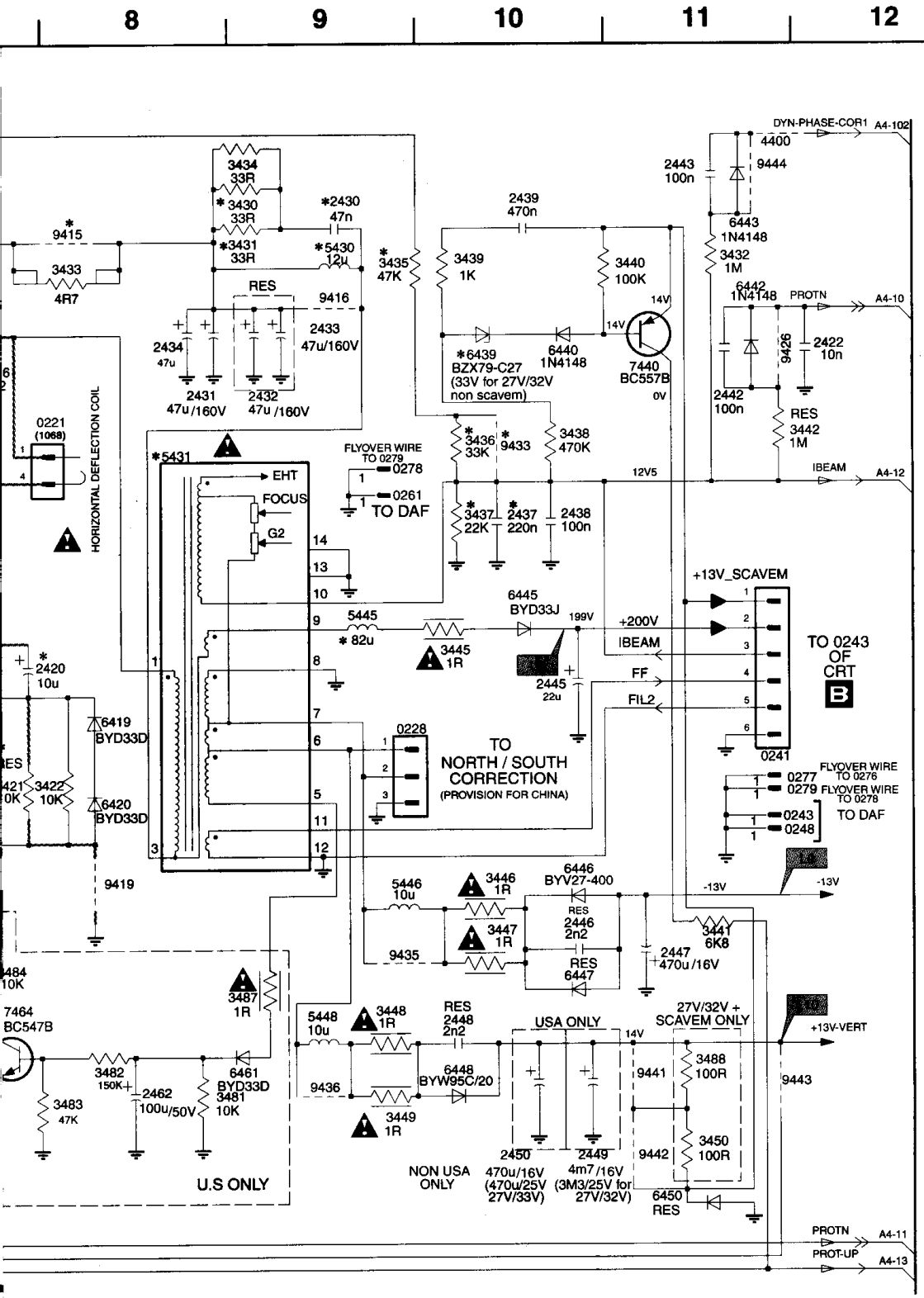

| Item# | 140V RFWS | 140V Audio 10W | 130V Audio 30W Subwoofer |
|---|---|---|---|
| 2974 | , | 1000U 35V | , |
| 2974 | 2200U 35V | , | 2200U 35V |
| 3901 | , | 4M7 | , |
| 3902 | , | 2M2 | , |
| 7971 | SE140N | SE140N | , |
| 7971 | , | , | SE130N |
| 9922 | jumper | , | jumper |
| 9923 | jumper | , | jumper |




| | |
|---|---|
| 0114 C3 | 3969 F11 |
| 0119 E9 | 3970 E10 |
| 0132 F3 | 3971 B11 |
| 0202 G3 | 3977 B10 |
| 0206 A8 | 3986 B10 |
| 0211 A2 | 3987 A10 |
| 0212 F2 | 3989 B11 |
| 0227 E2 | 3991 A10 |
| 0231 B5 | 3992 A10 |
| 0250 H3 | 3993 A11 |
| 1900 F4 | 3994 B11 |
| 1931 D3 | 3995 A11 |
| 1941 C8 | 3996 G6 |
| 1961 E8 | 3997 G8 |
| 2901 G4 | 4903 C11 |
| 2902 F4 | 5902 F5 |
| 2903 G5 | 5903 G7 |
| 2905 F6 | 5912 C7 |
| 2908 B3 | 5917 B5 |
| 2909 A3 | 5920 B5 |
| 2914 B4 | 5924 D5 |
| 2915 B5 | 5936 B8 |
| 2916 B5 | 5939 C11 |
| 2917 B6 | 5941 C8 |
| 2919 C5 | 5961 E8 |
| 2921 C3 | 5971 F7 |
| 2922 C6 | 6904 F5 |
| 2923 C5 | 6905 F6 |
| 2925 E4 | 6911 A3 |
| 2927 E6 | 6912 A4 |
| 2928 E7 | 6913 B4 |
| 2929 E7 | 6914 B3 |
| 2932 D3 | 6915 B3 |
| 2936 B8 | 6917 B5 |
| 2938 B8 | 6921 C5 |
| 2939 B9 | 6922 D4 |
| 2940 B9 | 6926 D6 |
| 2941 C8 | 6928 D6 |
| 2942 D8 | 6929 C6 |
| 2943 D9 | 6932 D3 |
| 2944 C12 | 6938 B8 |
| 2945 C11 | 6941 C8 |
| 2952 D10 | 6942 D8 |
| 2953 D10 | 6953 D10 |
| 2955 D9 | 6954 E10 |
| 2961 E9 | 6955 E10 |
| 2962 E9 | 6961 E9 |
| 2963 E8 | 6966 F11 |
| 2964 F8 | 6971 F8 |
| 2966 E12 | 6972 F8 |
| 2967 F10 | 6973 D11 |
| 2968 G10 | 6977 G8 |
| 2969 G10 | 6986 B10 |
| 2970 C6 | 6991 A10 |
| 2974 F8 | 7921 C4 |
| 2975 F9 | 7922 F11 |
| 2976 B5 | 7929 A6 |
| 2977 G8 | 7932 E3 |
| 3901 H2 | 7942 C9 |
| 3902 G2 | 7944 C11 |
| 3903 G4 | 7946 E12 |
| 3905 F6 | 7948 D11 |
| 3907 B3 | 7950 G11 |
| 3909 B2 | 7951 D11 |
| 3911 A2 | 7953 E10 |
| 3912 B2 | 7955 E9 |
| 3913 A4 | 7965 E11 |
| 3914 A4 | 7966 E10 |
| 3915 B4 | 7967 F10 |
| 3916 B6 | 7968 G9 |
| 3917 F10 | 7971 C11 |
| 3923 E5 | 7987 B11 |
| 3924 E4 | 7990 A11 |
| 3925 D4 | 7991 A12 |
| 3926 D6 | 9901 F5 |
| 3927 E6 | 9902 G5 |
| 3928 D6 | 9903 G7 |
| 3929 D6 | 9904 F5 |
| 3931 E3 | 9905 F6 |
| 3932 E3 | 9906 B5 |
| 3939 G6 | 9909 B3 |
| 3942 C9 | 9920 F10 |
| 3943 C10 | 9921 F11 |
| 3944 D11 | 9922 F3 |
| 3946 D12 | 9923 G3 |
| 3947 D9 | 9936 B7 |
| 3948 D11 | 9937 B7 |
| 3951 D11 | 9938 B8 |
| 3952 D10 | 9939 D6 |
| 3953 D10 | 9941 C8 |
| 3954 D10 | 9942 C8 |
| 3955 D10 | 9961 E8 |
| 3957 A7 | 9964 E9 |
| 3958 B7 | 9967 F11 |
| 3959 F11 | 9971 F8 |
| 3960 G11 | 9972 F7 |
| 3961 F12 | 9989 B8 |
| 3962 F10 | 9993 C11 |
| 3963 F8 | 9995 F4 |
| 3964 E10 | 9997 E9 |
| 3965 F11 | |
| 3966 F9 | |
| 3967 F10 | |
| 3968 G10 | |

## Line deflection






| | | |
|---|---|---|
| 0221 B7 | 3469 G2 | 9423 E6 |
| 0228 D9 | 3470 G2 | 9426 B11 |
| 0241 D11 | 3471 F2 | 9433 B10 |
| 0243 D12 | 3472 F2 | 9435 E9 |
| 0248 D12 | 3473 G2 | 9436 F9 |
| 0261 C10 | 3474 H3 | 9441 F11 |
| 0277 D12 | 3475 H3 | 9442 F11 |
| 0278 C10 | 3476 G3 | 9443 F12 |
| 0279 D12 | 3477 H4 | 9444 A11 |
| 2404 C3 | 3478 G4 | 9445 B5 |
| 2406 B2 | 3479 G5 | 9451 B4 |
| 2409 A5 | 3480 G6 | 9452 G7 |
| 2411 B5 | 3481 F9 | 9453 E2 |
| 2414 B7 | 3482 F8 | 9456 F4 |
| 2415 B7 | 3483 F8 | 9457 E3 |
| 2416 B7 | 3484 E7 | 9458 D4 |
| 2417 C7 | 3485 E7 | 9459 E4 |
| 2418 D6 | 3486 F7 | 9460 F2 |
| 2419 D7 | 3487 E9 | 9461 G2 |
| 2420 D8 | 3488 F11 | 9464 E6 |
| 2421 F4 | 3489 G3 | 9496 G5 |
| 2422 B12 | 3490 G3 | |
| 2430 A9 | 3491 H3 | |
| 2431 B8 | 3492 G4 | |
| 2432 B9 | 3493 G4 | |
| 2433 B9 | 3494 G4 | |
| 2434 B8 | 3495 D5 | |
| 2437 C10 | 3497 E5 | |
| 2438 C10 | 3XXX H2 | |
| 2439 A10 | 3XXX E5 | |
| 2442 B11 | 4400 A11 | |
| 2443 A11 | 4401 E3 | |
| 2445 D10 | 4411 E4 | |
| 2446 E10 | 5405 B3 | |
| 2447 E11 | 5406 B3 | |
| 2448 E10 | 5407 B4 | |
| 2449 F10 | 5410 B5 | |
| 2450 F10 | 5411 B6 | |
| 2461 E3 | 5417 C7 | |
| 2462 F8 | 5430 A9 | |
| 2463 E2 | 5431 B8 | |
| 2467 H4 | 5445 C9 | |
| 2468 D5 | 5446 E9 | |
| 2469 D6 | 5448 E9 | |
| 2471 G3 | 5474 F2 | |
| 2472 G4 | 5475 F3 | |
| 2473 G2 | 5476 F3 | |
| 2474 F4 | 5478 F5 | |
| 2475 F4 | 5479 F5 | |
| 2476 F4 | 6407 B4 | |
| 2477 F4 | 6413 C5 | |
| 2478 H4 | 6414 B6 | |
| 2479 G4 | 6415 B7 | |
| 2480 F2 | 6419 D8 | |
| 2481 G2 | 6420 D8 | |
| 2484 B2 | 6439 B10 | |
| 2485 C3 | 6440 B10 | |
| 2486 C3 | 6442 B11 | |
| 2487 F4 | 6443 A11 | |
| 2488 H5 | 6445 C10 | |
| 2489 E6 | 6446 E10 | |
| 3401 C2 | 6447 E10 | |
| 3402 C2 | 6448 F10 | |
| 3403 C3 | 6450 F11 | |
| 3404 A2 | 6461 F9 | |
| 3405 A3 | 6463 F7 | |
| 3406 A3 | 6464 F7 | |
| 3407 B4 | 6466 E4 | |
| 3409 A5 | 6467 E2 | |
| 3410 C4 | 6468 G3 | |
| 3411 B6 | 6472 F2 | |
| 3412 C6 | 6474 F3 | |
| 3413 C6 | 6475 F4 | |
| 3414 B3 | 6480 G6 | |
| 3417 C7 | 6481 A5 | |
| 3421 D7 | 6482 E2 | |
| 3422 D8 | 6483 E3 | |
| 3423 D7 | 6484 E5 | |
| 3430 A9 | 6485 D5 | |
| 3431 A9 | 6486 G5 | |
| 3432 A11 | 6487 G5 | |
| 3433 A8 | 7408 A3 | |
| 3434 A9 | 7410 B5 | |
| 3435 A9 | 7440 B11 | |
| 3436 B10 | 7461 E3 | |
| 3437 C10 | 7464 E7 | |
| 3438 B10 | 7467 F7 | |
| 3439 A10 | 7470 G3 | |
| 3440 A11 | 7478 H5 | |
| 3441 E11 | 7480 G6 | |
| 3442 B12 | 7481 C3 | |
| 3445 D10 | 7482 D3 | |
| 3446 E10 | 9402 C4 | |
| 3447 E10 | 9403 B4 | |
| 3448 E9 | 9405 G3 | |
| 3449 F9 | 9409 B6 | |
| 3450 F11 | 9412 C6 | |
| 3451 D5 | 9413 F4 | |
| 3456 E2 | 9415 A8 | |
| 3459 G2 | 9416 B9 | |
| 3460 E3 | 9419 E8 | |

## Diversity table diagram A2

| Item # | 28" BLD WS | 32" BLS WS | 32" RF WS | 24" BLD WS | 32" BLS WSThomson | 28" BLS WSThomson | 29" RF |
|---|---|---|---|---|---|---|---|
| 2271 | , | , | , | , | , | , | 50V / 1U |
| 2411 | , | , | , | 1N 2KV | , | , | , |
| 2411 | , | , | , | , | , | 1N2 2KV | , |
| 2411 | 1N5 2KV | 1N5 2KV | 1N5 2KV | , | 1N5 2KV | , | , |
| 2411 | , | , | , | , | , | , | 1N8 2KV |
| 2416 | , | , | 820P 2KV | , | , | , | , |
| 2416 | , | 1N 2KV | , | , | , | , | , |
| 2416 | 1N2 2KV | , | , | , | , | , | , |
| 2416 | , | , | , | , | , | , | 1N5 2KV |
| 2416 | , | , | , | , | 1N8 2KV | 1N8 2KV | , |
| 2416 | , | , | , | 2N2 2KV | , | , | , |
| 2419 | , | , | , | , | , | , | 360N 250V |
| 2419 | , | , | 430N 250V | , | , | , | , |
| 2419 | , | , | , | , | , | , | , |
| 2419 | 680N 2KV | , | , | 680N 2KV | , | 680N 2KV | , |
| 2419 | , | 820N 2KV | , | , | 820N 2KV | , | , |
| 2420 | 4U7 2KV | , | , | , | , | 4U7 2KV | , |
| 2420 | , | 2U2 160V | 2U2 160V | 2U2 160V | 2U2 160V | , | 2U2 160V |
| 2430 | , | 27N 50V | 27N 50V | , | 27N 50V | 27N 50V | , |
| 2430 | 10N 50V | , | , | 10N 50V | , | , | , |
| 2430 | , | , | , | , | , | , | 15N 50V |
| 2437 | , | , | , | 100N 250V | , | 100N 250V | , |
| 2437 | 150N 250V | , | 150N 250V | , | , | , | , |
| 2437 | , | 220N 250V | , | , | 220N 250V | , | 220N 250V |
| 2449 | 470U 16V | 470U 16V | 470U 16V | 470U 16V | 470U 16V | 470U 16V | , |
| 2449 | , | , | , | , | , | , | 470U 25V |
| 2474 | , | , | , | , | , | , | 27N 400V |
| 2474 | 7N5 1K6V | 7N5 1K6V | 7N5 1K6V | 7N5 1K6V | , | 7N5 1K6V | , |
| 2474 | , | , | , | , | 9N1 1K6V | , | , |
| 2477 | 430N 250V | 430N 250V | 430N 250V | 430N 250V | , | 430N 250V | , |
| 2477 | , | , | , | , | 470N 250V | , | , |
| 2487 | 7N5 1K6V | 7N5 1K6V | 7N5 1K6V | 7N5 1K6V | , | 7N5 1K6V | , |
| 2487 | , | , | , | , | 9N1 1K6V | , | , |
| 3272 | , | , | , | , | , | , | 100K |
| 3403 | 3K3 | 3K3 | 3K3 | 3K3 | 3K3 | 3K3 | , |
| 3403 | , | , | , | , | , | , | 5K6 |
| 3405 | 4K7 | , | 4K7 | 4K7 | , | , | 4K7 |
| 3405 | , | 5K6 | , | , | 5K6 | 5K6 | , |
| 3430 | , | , | , | , | , | , | 15R |
| 3430 | 3 3 R | 3 3 R | 3 3 R | 3 3 R | 3 3 R | 3 3 R | , |
| 3435 | , | 27K | , | , | 27K | , | , |
| 3435 | , | , | 39K | , | , | 39K | 39K |
| 3435 | 47K , | , | , | 47K , | , | , | , |
| 3436 | , | , | , | , | , | 39K | 39K |
| 3436 | , | , | 47K | , | , | , | , |
| 3436 | , | 56K | , | , | 56K | , | , |
| 3436 | 68K | , | , | 68K | , | , | , |

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140300

1 2 3

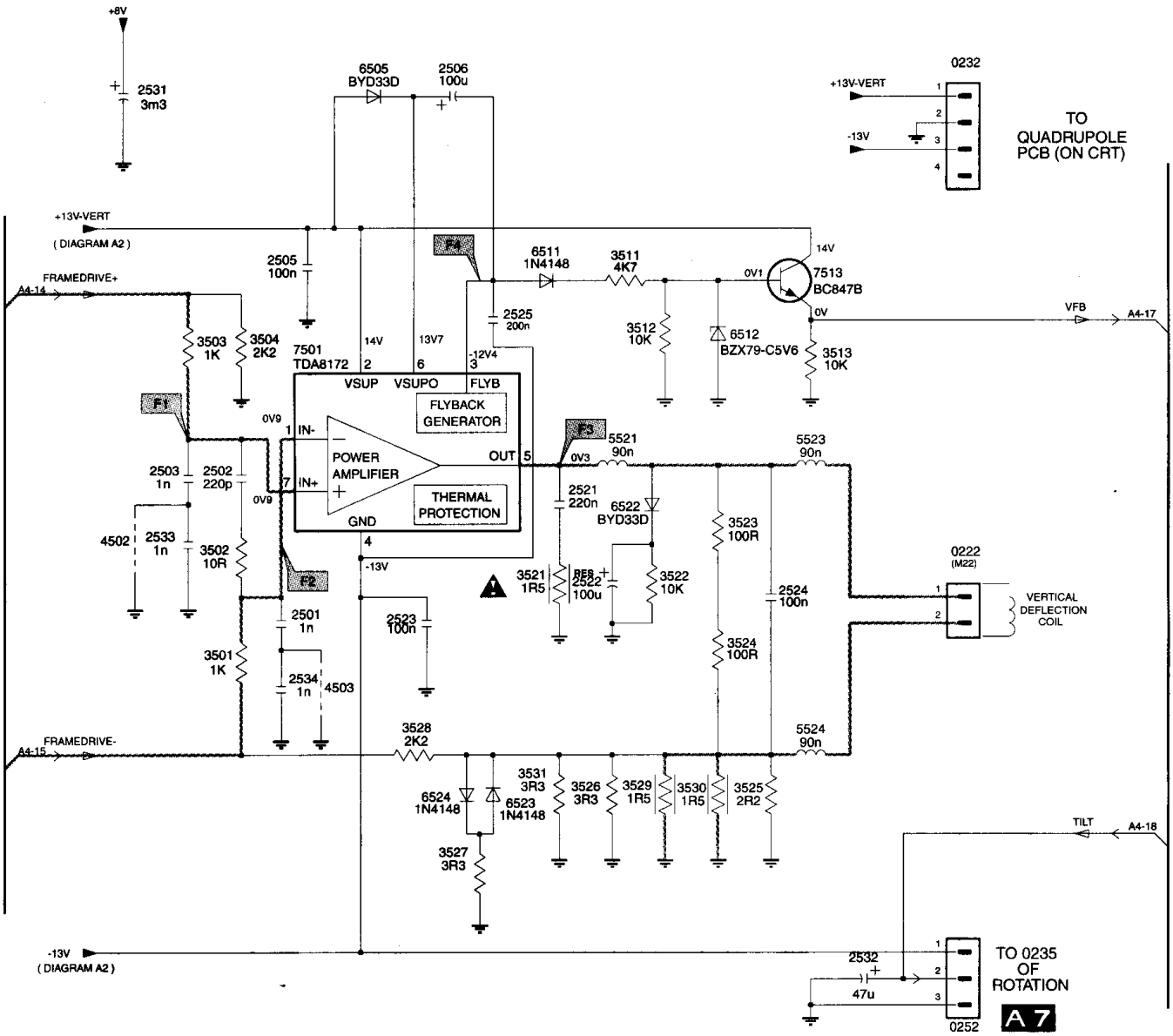
A B C D E F G H

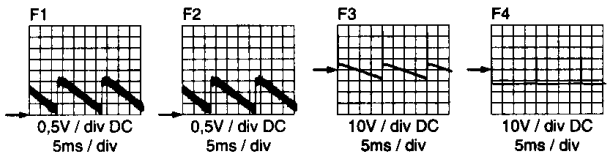
# A3 FRAME DEFLEC

| Item # | 28" BLD WS | 32" BLS WS | 32" RF WS | 24" BLD WS | 32" BLS WSThomson | 28" BLS WSThomson | 29" RF |
|---|---|---|---|---|---|---|---|
| 2271 | , | , | , | , | , | , | 50V / 1U |
| 2411 | , | , | , | 1N 2KV | , | , | , |
| 2411 | , | , | , | , | , | 1N2 2KV | , |
| 2411 | 1N5 2KV | 1N5 2KV | 1N5 2KV | , | 1N5 2KV | , | , |
| 2411 | , | , | , | , | , | , | 1N8 2KV |
| 2416 | , | , | 820P 2KV | , | , | , | , |
| 2416 | , | 1N 2KV | , | , | , | , | , |
| 2416 | 1N2 2KV | , | , | , | , | , | , |
| 2416 | , | , | , | , | , | , | 1N5 2KV |
| 2416 | , | , | , | , | 1N8 2KV | 1N8 2KV | , |
| 2416 | , | , | , | 2N2 2KV | , | , | , |
| 2419 | , | , | , | , | , | , | 360N 250V |
| 2419 | , | , | 430N 250V | , | , | , | , |
| 2419 | , | , | , | , | , | , | , |
| 2419 | 680N 2KV | , | , | 680N 2KV | , | 680N 2KV | , |
| 2419 | , | 820N 2KV | , | , | 820N 2KV | , | , |
| 2420 | 4U7 2KV | , | , | , | , | 4U7 2KV | , |
| 2420 | , | 2U2 160V | 2U2 160V | 2U2 160V | 2U2 160V | , | 2U2 160V |
| 2430 | , | 27N 50V | 27N 50V | , | 27N 50V | 27N 50V | , |
| 2430 | 10N 50V | , | , | 10N 50V | , | , | , |
| 2430 | , | , | , | , | , | , | 15N 50V |
| 2437 | , | , | , | 100N 250V | , | 100N 250V | , |
| 2437 | 150N 250V | , | 150N 250V | , | , | , | , |
| 2437 | , | 220N 250V | , | , | 220N 250V | , | 220N 250V |
| 2449 | 470U 16V | 470U 16V | 470U 16V | 470U 16V | 470U 16V | 470U 16V | , |
| 2449 | , | , | , | , | , | , | 470U 25V |
| 2474 | , | , | , | , | , | , | 27N 400V |
| 2474 | 7N5 1K6V | 7N5 1K6V | 7N5 1K6V | 7N5 1K6V | , | 7N5 1K6V | , |
| 2474 | , | , | , | , | 9N1 1K6V | , | , |
| 2477 | 430N 250V | 430N 250V | 430N 250V | 430N 250V | , | 430N 250V | , |
| 2477 | , | , | , | , | 470N 250V | , | , |
| 2487 | 7N5 1K6V | 7N5 1K6V | 7N5 1K6V | 7N5 1K6V | , | 7N5 1K6V | , |
| 2487 | , | , | , | , | 9N1 1K6V | , | , |
| 3272 | , | , | , | , | , | , | 100K |
| 3403 | 3K3 | 3K3 | 3K3 | 3K3 | 3K3 | 3K3 | , |
| 3403 | , | , | , | , | , | , | 5K6 |
| 3405 | 4K7 | , | 4K7 | 4K7 | , | , | 4K7 |
| 3405 | , | 5K6 | , | , | 5K6 | 5K6 | , |
| 3430 | , | , | , | , | , | , | 15R |
| 3430 | 3 3 R | 3 3 R | 3 3 R | 3 3 R | 3 3 R | 3 3 R | , |
| 3435 | , | 27K | , | , | 27K | , | , |
| 3435 | , | , | 39K | , | , | 39K | 39K |
| 3435 | 47K , | , | , | 47K , | , | , | , |
| 3436 | , | , | , | , | , | 39K | 39K |
| 3436 | , | , | 47K | , | , | , | , |
| 3436 | , | 56K | , | , | 56K | , | , |
| 3436 | 68K | , | , | 68K | , | , | , |

1 2 3

# CTION

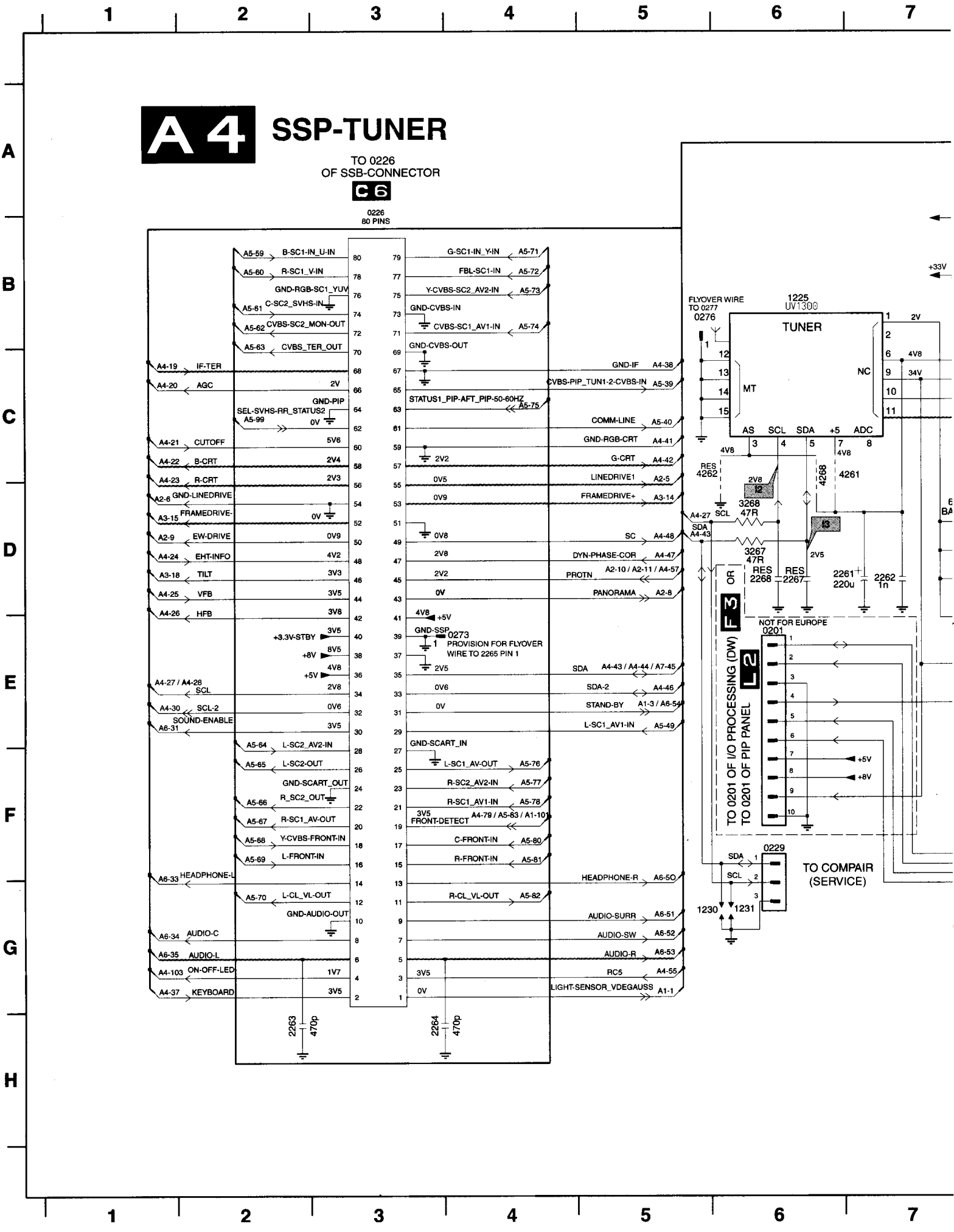


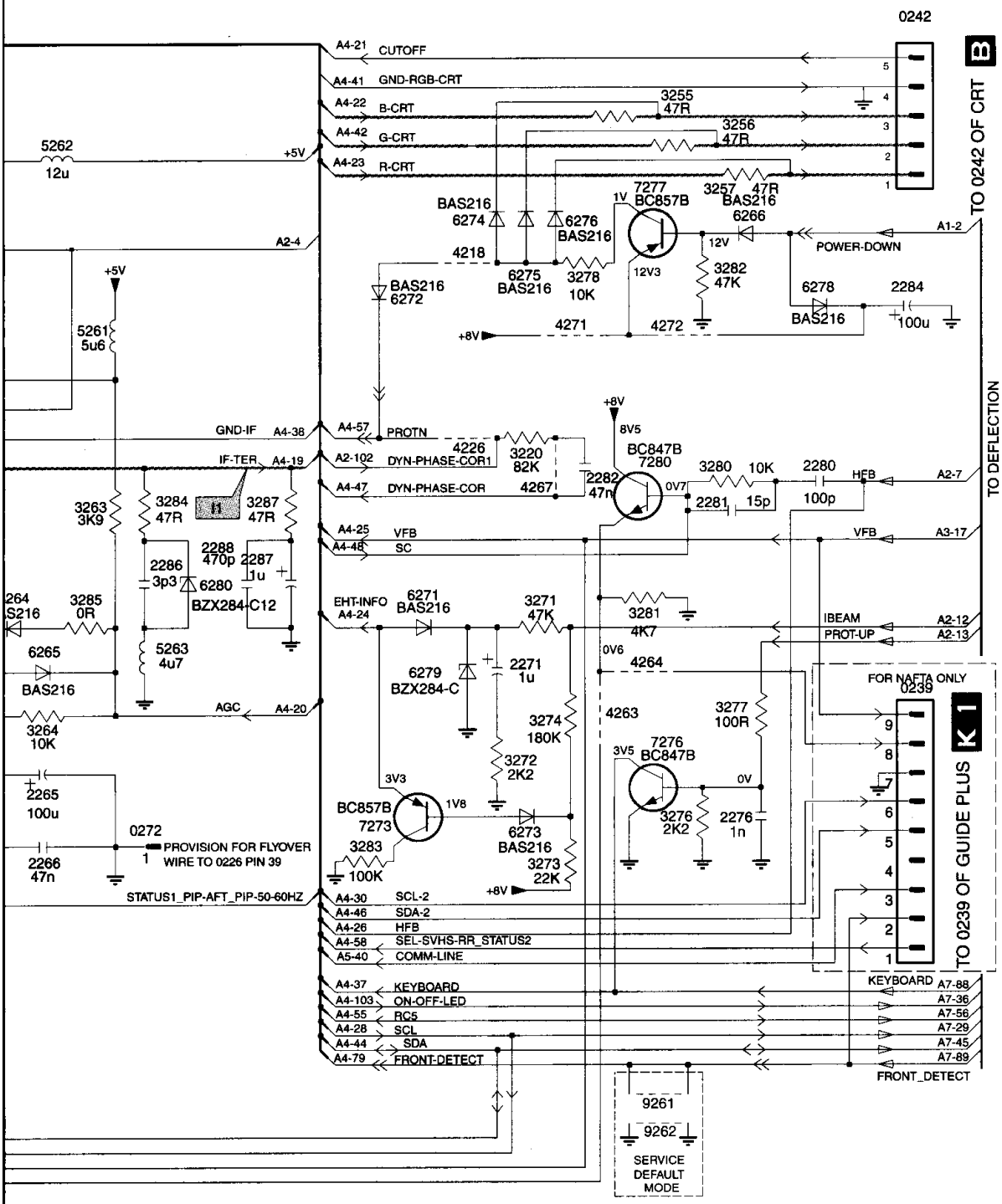




CL 06532012_052.eps
140300

0222 D9
0232 B9
0252 G9
2501 E6
2502 D5
2503 D5
2505 C6
2506 B6
2521 D7
2522 D7
2523 E6
2524 E8
2525 C7
2531 B4
2532 F9
2533 D5
2534 E6
3501 E5
3502 D5
3503 C5
3504 C5
3511 C7
3512 C8
3513 C9
3521 D7
3522 D8
3523 D8
3524 E8
3525 F8
3526 F7
3527 F7
3528 E7
3529 F7
3530 F8
4502 D5
4503 E6
5521 D7
5523 D8
5524 E8
6505 B6
6511 C7
6512 C8
6522 D7
7501 C6
7513 C8

## SSP-Tuner

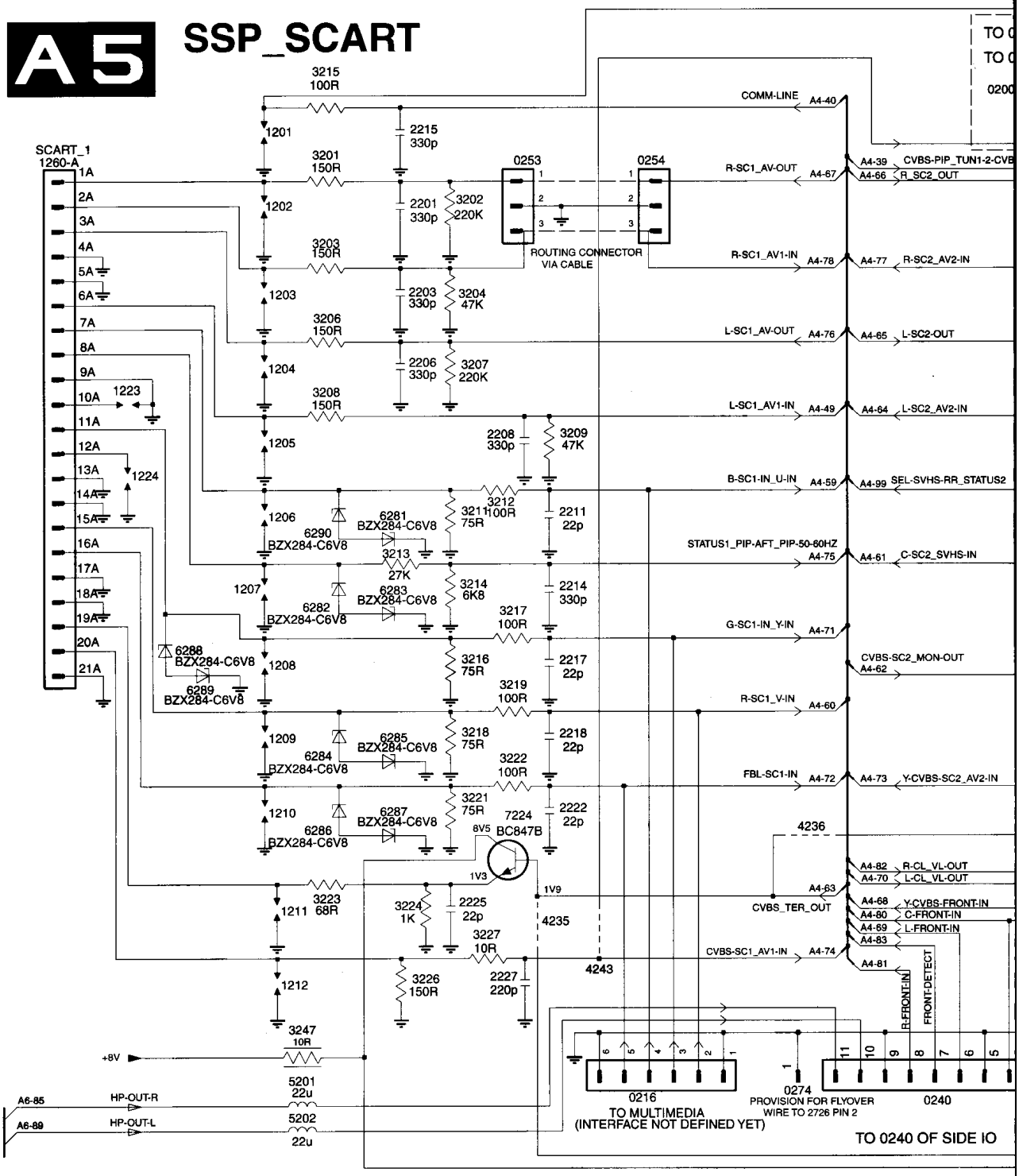

A 4 SSP-TUNER
TO 0226
OF SSB-CONNECTOR
C 6
0226
80 PINS
TUNER
1225
UV1300
FLYOVER WIRE
TO 0277
0276
NOT FOR EUROPE
0201
TO 0201 OF I/O PROCESSING (DW)
TO 0201 OF PIP PANEL
0229
TO COMPAIR
(SERVICE)
0273
PROVISION FOR FLYOVER
WIRE TO 2265 PIN 1
B-SC1-IN_U-IN
R-SC1_V-IN
GND-RGB-SC1_YUV
C-SC2_SVHS-IN
CVBS-SC2_MON-OUT
CVBS_TER_OUT
IF-TER
AGC
GND-PIP
SEL-SVHS-RR_STATUS2
CUTOFF
B-CRT
R-CRT
GND-LINEDRIVE
FRAMEDRIVE-
EW-DRIVE
EHT-INFO
TILT
VFB
HFB
+3.3V-STBY
+8V
+5V
SCL
SCL-2
SOUND-ENABLE
L-SC2_AV2-IN
L-SC2-OUT
GND-SCART_OUT
R_SC2_OUT
R-SC1_AV-OUT
Y-CVBS-FRONT-IN
L-FRONT-IN
HEADPHONE-L
L-CL_VL-OUT
GND-AUDIO-OUT
AUDIO-C
AUDIO-L
ON-OFF-LED
KEYBOARD
G-SC1-IN_Y-IN
FBL-SC1-IN
Y-CVBS-SC2_AV2-IN
GND-CVBS-IN
CVBS-SC1_AV1-IN
GND-CVBS-OUT
STATUS1_PIP-AFT_PIP-50-60HZ
GND-SSP
SDA
SDA-2
STAND-BY
L-SC1_AV1-IN
GND-SCART_IN
L-SC1_AV-OUT
R-SC2_AV2-IN
R-SC1_AV1-IN
FRONT-DETECT
C-FRONT-IN
R-FRONT-IN
HEADPHONE-R
R-CL_VL-OUT
AUDIO-SURR
AUDIO-SW
AUDIO-R
RC5
LIGHT-SENSOR_VDEGAUSS
GND-IF
CVBS-PIP_TUN1-2-CVBS-IN
COMM-LINE
GND-RGB-CRT
G-CRT
LINEDRIVE1
FRAMEDRIVE+
SC
DYN-PHASE-COR
PROTN
PANORAMA
2263
470p
2264
470p

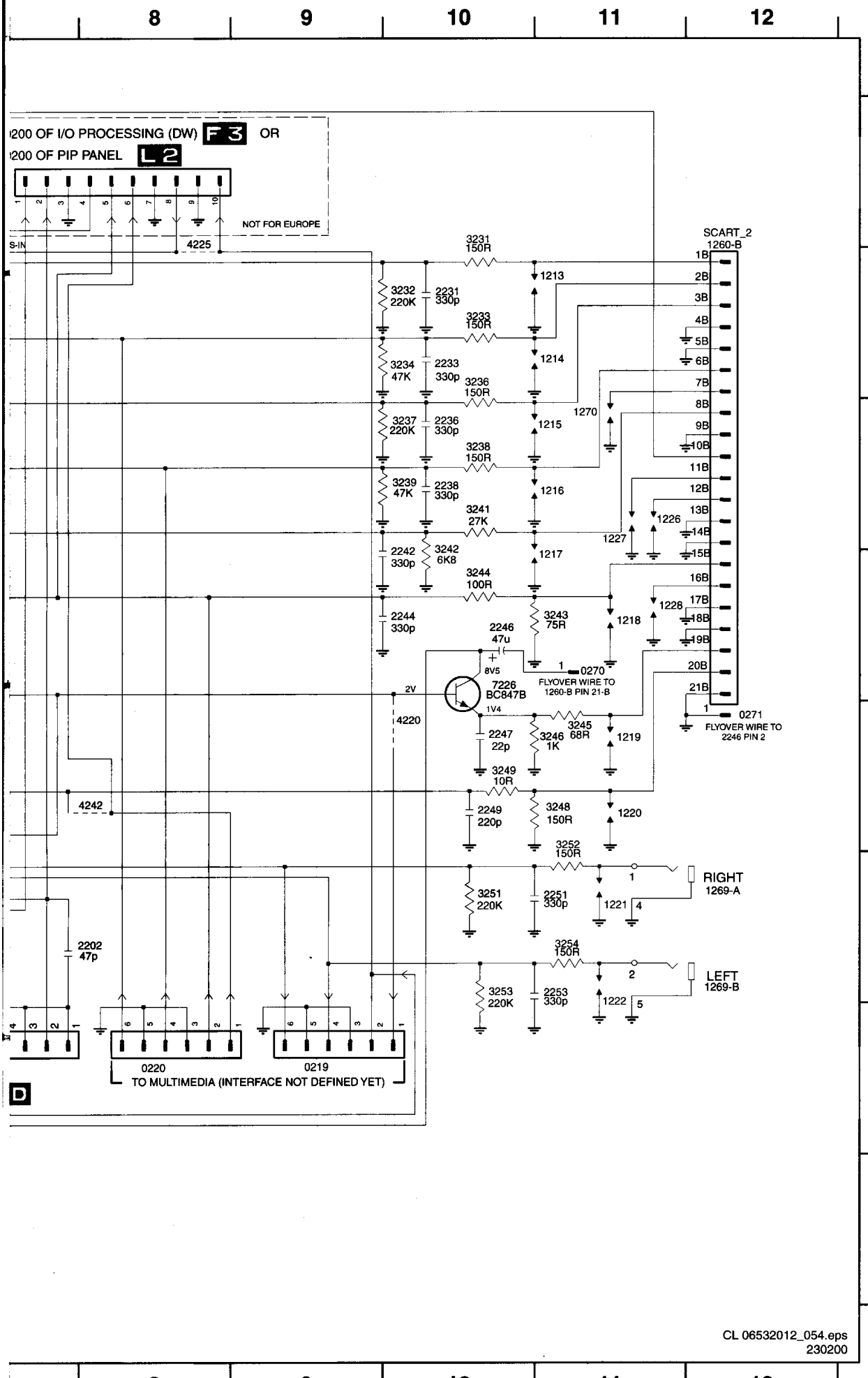



CL 06532012_053.eps
030300

0201 E6
0226 A3
0229 F6
0239 D12
0242 A12
0272 E8
0273 E4
0276 B5
1225 B6
1230 G5
1231 G6
2261 D6
2262 D7
2263 H2
2264 H3
2265 E7
2266 E8
2267 D6
2268 D6
2271 D10
2276 E11
2280 C11
2281 C11
2282 C10
2284 B12
2286 C8
2287 C9
3220 C10
3255 A11
3256 A11
3257 B11
3263 C8
3264 D7
3267 D6
3268 D6
3271 D10
3272 D10
3273 E10
3274 D10
3276 E11
3277 D11
3278 B10
3280 C11
3281 D10
3282 B11
3283 E9
3284 C8
3285 D8
3287 C9
4218 B10
4226 C10
4261 C7
4262 C5
4263 D10
4264 D10
4267 C10
4268 C6
4271 B10
4272 B11
5261 B8
5262 A8
5263 D8
6264 D7
6265 D8
6266 B11
6271 D9
6272 B9
6273 E10
6274 B10
6275 B10
6276 B10
6278 B11
6279 D9
6280 D8
7273 E9
7276 D11
7277 B11
7280 C11
9261 F10
9262 F11

## SSP-SCART

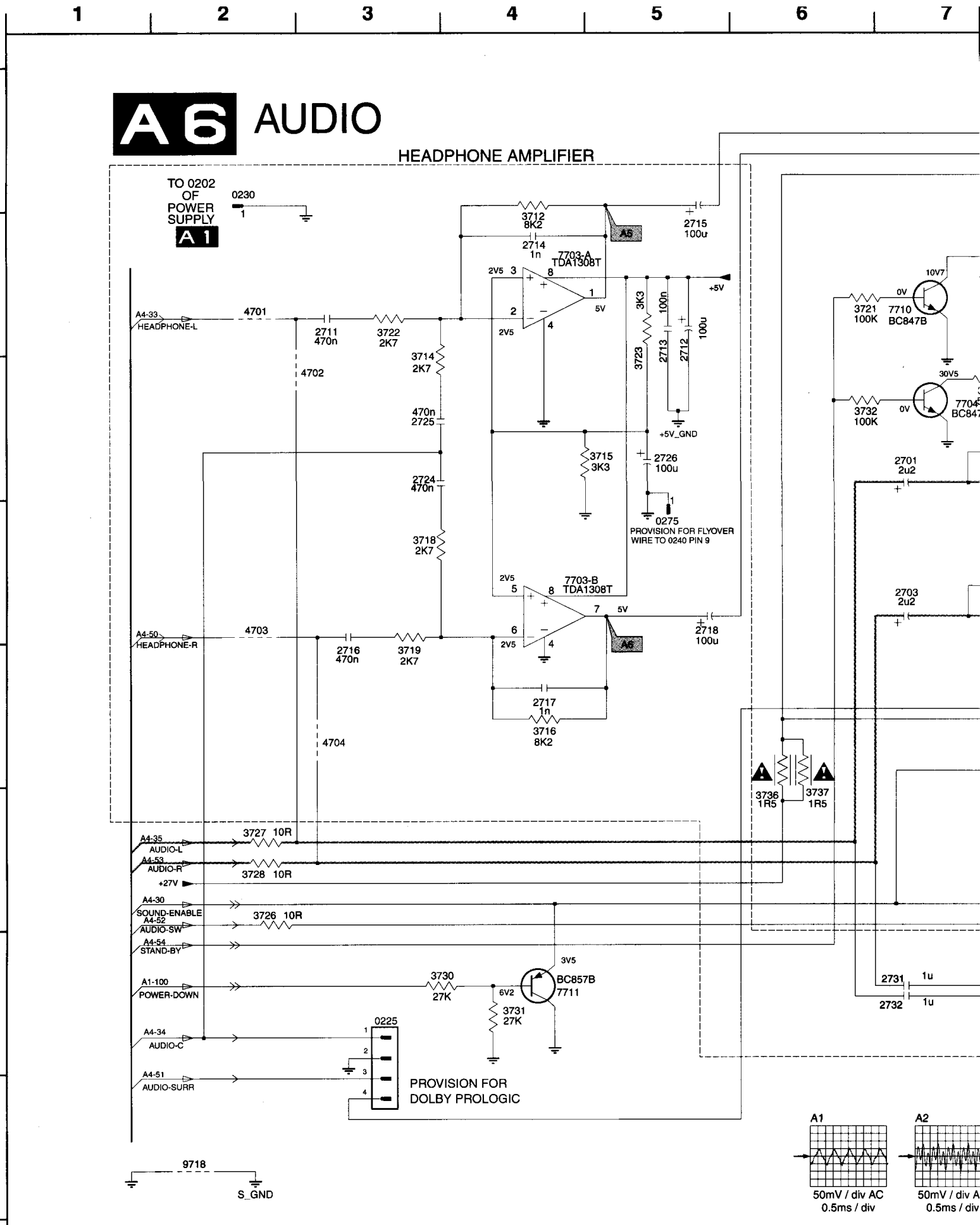

A5
SSP_SCART
SCART_1
1260-A
3215 100R
2215 330p
3201 150R
2201 330p
3202 220K
3203 150R
2203 330p
3204 47K
3206 150R
2206 330p
3207 220K
3208 150R
2208 330p
3209 47K
3212 100R
3211 75R
2211 22p
3213 27K
3214 6K8
2214 330p
3217 100R
3216 75R
2217 22p
3219 100R
3218 75R
2218 22p
3222 100R
3221 75R
2222 22p
3223 68R
3224 1K
2225 22p
3227 10R
3226 150R
2227 220p
3247 10R
5201 22u
5202 22u
6281 BZX284-C6V8
6290 BZX284-C6V8
6283 BZX284-C6V8
6282 BZX284-C6V8
6285 BZX284-C6V8
6284 BZX284-C6V8
6287 BZX284-C6V8
6286 BZX284-C6V8
6288 BZX284-C6V8
6289 BZX284-C6V8
7224 BC847B
8V5
1V3
1V9
4235
4236
4243
1201
1202
1203
1204
1205
1206
1207
1208
1209
1210
1211
1212
1223
1224
0253
0254
ROUTING CONNECTOR VIA CABLE
0216
TO MULTIMEDIA (INTERFACE NOT DEFINED YET)
0274
PROVISION FOR FLYOVER WIRE TO 2726 PIN 2
0240
TO 0240 OF SIDE IO
COMM-LINE A4-40
R-SC1_AV-OUT A4-67
A4-39 CVBS-PIP_TUN1-2-CVB
A4-66 R_SC2_OUT
R-SC1_AV1-IN A4-78
A4-77 R-SC2_AV2-IN
L-SC1_AV-OUT A4-76
A4-65 L-SC2-OUT
L-SC1_AV1-IN A4-49
A4-64 L-SC2_AV2-IN
B-SC1-IN_U-IN A4-59
A4-99 SEL-SVHS-RR_STATUS2
STATUS1_PIP-AFT_PIP-50-60HZ A4-75
A4-61 C-SC2_SVHS-IN
G-SC1-IN_Y-IN A4-71
CVBS-SC2_MON-OUT A4-62
R-SC1_V-IN A4-60
FBL-SC1-IN A4-72
A4-73 Y-CVBS-SC2_AV2-IN
CVBS_TER_OUT A4-63
A4-82 R-CL_VL-OUT
A4-70 L-CL_VL-OUT
A4-68 Y-CVBS-FRONT-IN
A4-80 C-FRONT-IN
A4-69 L-FRONT-IN
A4-83
A4-81
CVBS-SC1_AV1-IN A4-74
R-FRONT-IN
FRONT-DETECT
+8V
A6-85 HP-OUT-R
A6-89 HP-OUT-L

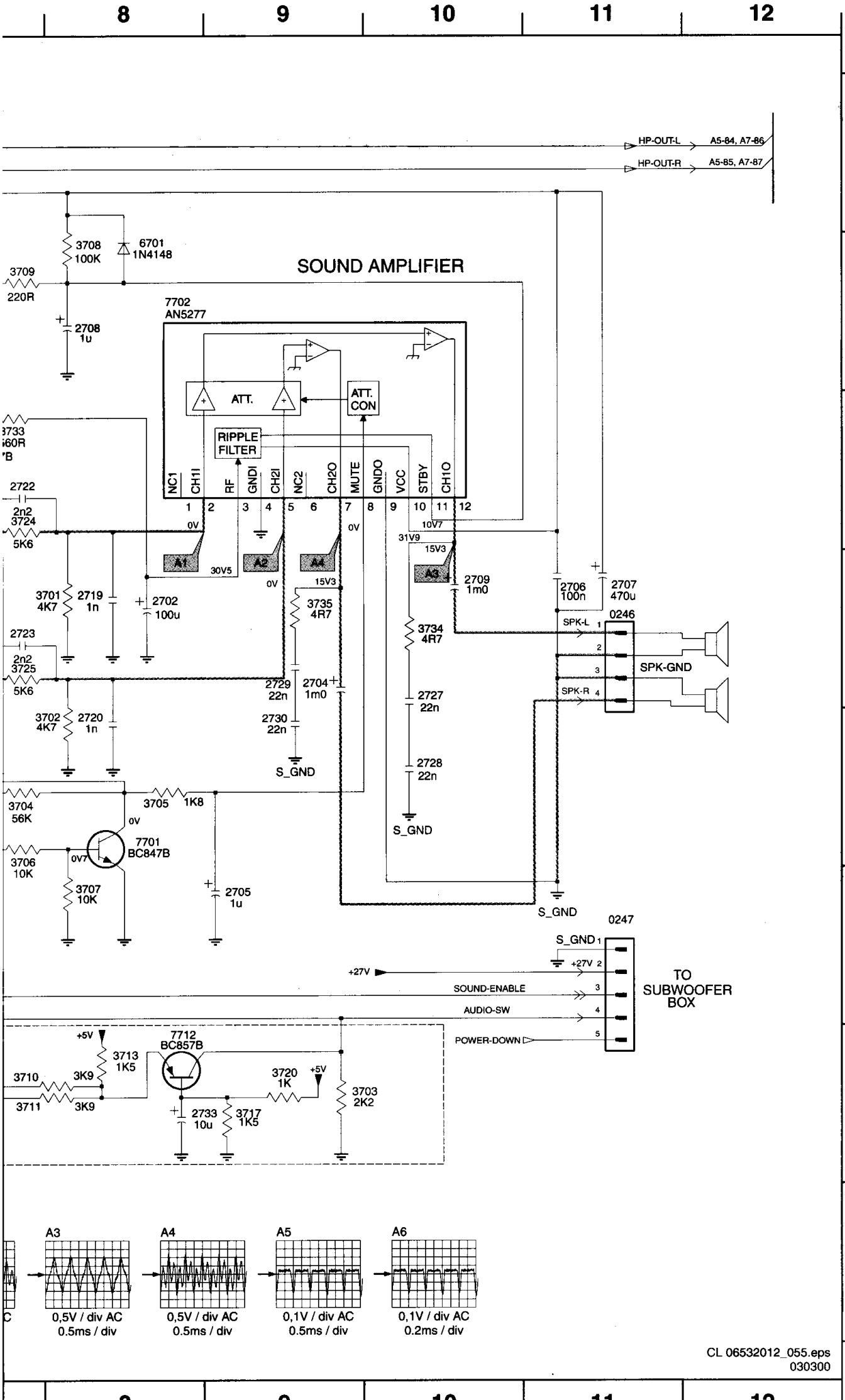




0200 A7
0216 G5
0219 G9
0220 G8
0240 G7
0253 B4
0254 B5
0270 D11
0271 E12
0274 G6
1201 A3
1202 B3
1203 B3
1204 C3
1205 C3
1206 D3
1207 D3
1208 D3
1209 E3
1210 E3
1211 F3
1212 F3
1213 B11
1214 B11
1215 C11
1216 C11
1217 D11
1218 D11
1219 E11
1220 E11
1221 F11
1222 G11
1223 C2
1224 C2
1226 C11
1227 C11
1228 D11
1260-A B2
1260-B B12
1269-A F12
1269-B F12
1270 C11
2201 B4
2202 F8
2203 B4
2206 C4
2208 C4
2211 D4
2214 D4
2215 A4
2217 D4
2218 E4
2222 E4
2225 F4
2227 F4
2231 B10
2233 B10
2236 C10
2238 C10
2242 D10
2244 D10
2246 D10
2247 E10
2249 E10
2251 F11
2253 F11
3201 A3
3202 B4
3203 B3
3204 B4
3206 B3
3207 C4
3208 C3
3209 C4
3211 D4
3212 C4
3213 D3
3214 D4
3215 A3
3216 D4
3217 D4
3218 E4
3219 E4
3221 E4
3222 E4
3223 F3
3224 F4
3226 F4
3227 F4
3231 A10
3232 B10
3233 B10
3234 B10
3236 B10
3237 C10
3238 C10
3239 C10
3241 C10
3242 D10
3243 D11
3244 D10
3245 E11
3246 E11
3247 G3
3248 E11
3249 E10
3251 F10
3252 E11
3253 F10
3254 F11
4220 E10
4225 B8
4235 F4
4236 E6
4242 E8
4243 F5
5201 G3
5202 G3
6280 D3
6281 D3
6282 D3
6283 D3
6284 E3
6285 E3
6286 E3
6287 E3
6288 D2
6289 E2
7224 E4
7226 D10

## Audio

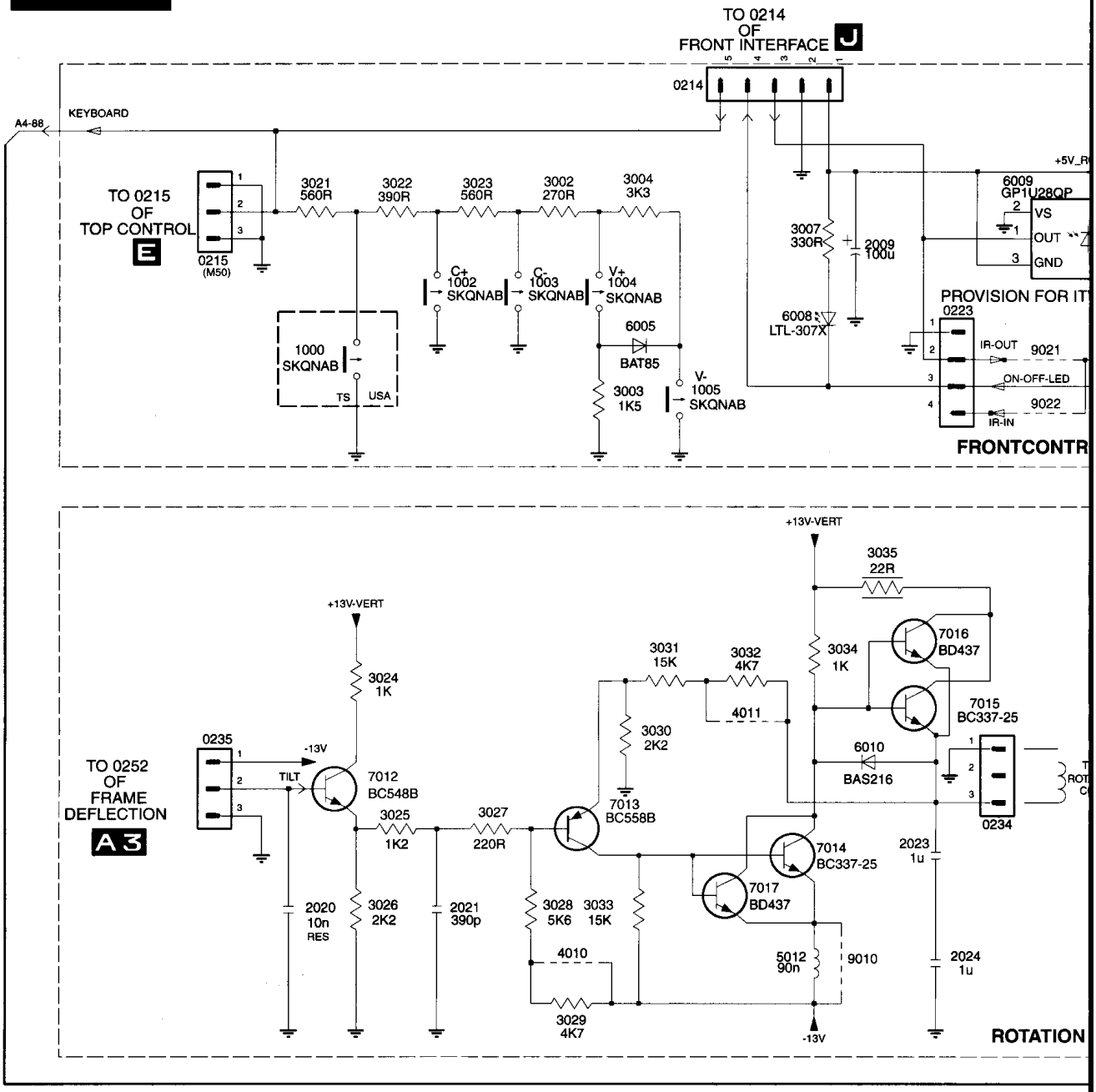

A6 AUDIO
HEADPHONE AMPLIFIER
TO 0202 OF POWER SUPPLY A1
0230
3712 8K2
2714 1n
2715 100u
7703-A TDA1308T
2V5
5V
+5V
A4-33 HEADPHONE-L
4701
2711 470n
3722 2K7
3714 2K7
4702
470n 2725
2724 470n
3718 2K7
3715 3K3
2726 100u
+5V_GND
0275
PROVISION FOR FLYOVER WIRE TO 0240 PIN 9
3723 3K3
2713 100n
2712 100u
10V7
3721 100K
7710 BC847B
30V5
3732 100K
2701 2u2
2703 2u2
7703-B TDA1308T
A4-50 HEADPHONE-R
4703
2716 470n
3719 2K7
2717 1n
3716 8K2
4704
3736 1R5
3737 1R5
A4-35 AUDIO-L
3727 10R
A4-53 AUDIO-R
3728 10R
+27V
A4-30 SOUND-ENABLE
A4-52 AUDIO-SW
A4-54 STAND-BY
3726 10R
A1-100 POWER-DOWN
3730 27K
3V5
BC857B 7711
6V2
3731 27K
2731 1u
2732 1u
0225
A4-34 AUDIO-C
A4-51 AUDIO-SURR
PROVISION FOR DOLBY PROLOGIC
9718
S_GND
A1
50mV / div AC
0.5ms / div
A2
50mV / div A
0.5ms / div



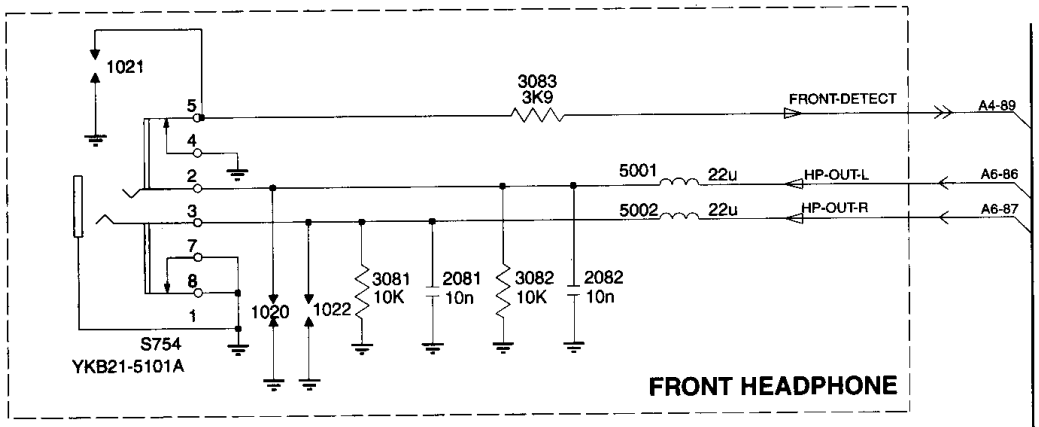

0225 G3
0230 A2
0246 D11
0247 F11
0275 D5
2701 C7
2702 D8
2703 D7
2704 D9
2705 F9
2706 D11
2707 D11
2708 B8
2709 D10
2711 B3
2712 B5
2713 B5
2714 B4
2715 B5
2716 E3
2717 E4
2718 D5
2719 D8
2720 E8
2722 C7
2723 D7
2724 C3
2725 C3
2726 C5
2727 D10
2728 E10
2729 D9
2730 E9
2731 G7
2732 G7
2733 G8
3701 D8
3702 E8
3703 G10
3704 E7
3705 E8
3706 E7
3707 F8
3708 B8
3709 B7
3710 G7
3711 G7
3712 B4
3713 G8
3714 C3
3715 C5
3716 E4
3717 G9
3718 D3
3719 E3
3720 G9
3721 B6
3722 B3
3723 C5
3724 C7
3725 D7
3726 F2
3727 F2
3728 F2
3730 G4
3731 G4
3732 C6
3733 C7
3734 D10
3735 D9
3736 F6
3737 F6
4701 B2
4702 C3
4703 D2
4704 E3
6701 B8
7701 E8
7702 B8
7703-A B4
7703-B D4
7704 C7
7710 B7
7711 G4
7712 G8
9718 H2

## Front control / Rotation / Headphone

# A7 FRONT CONTROL / ROTATION / HEAD



# PHONE



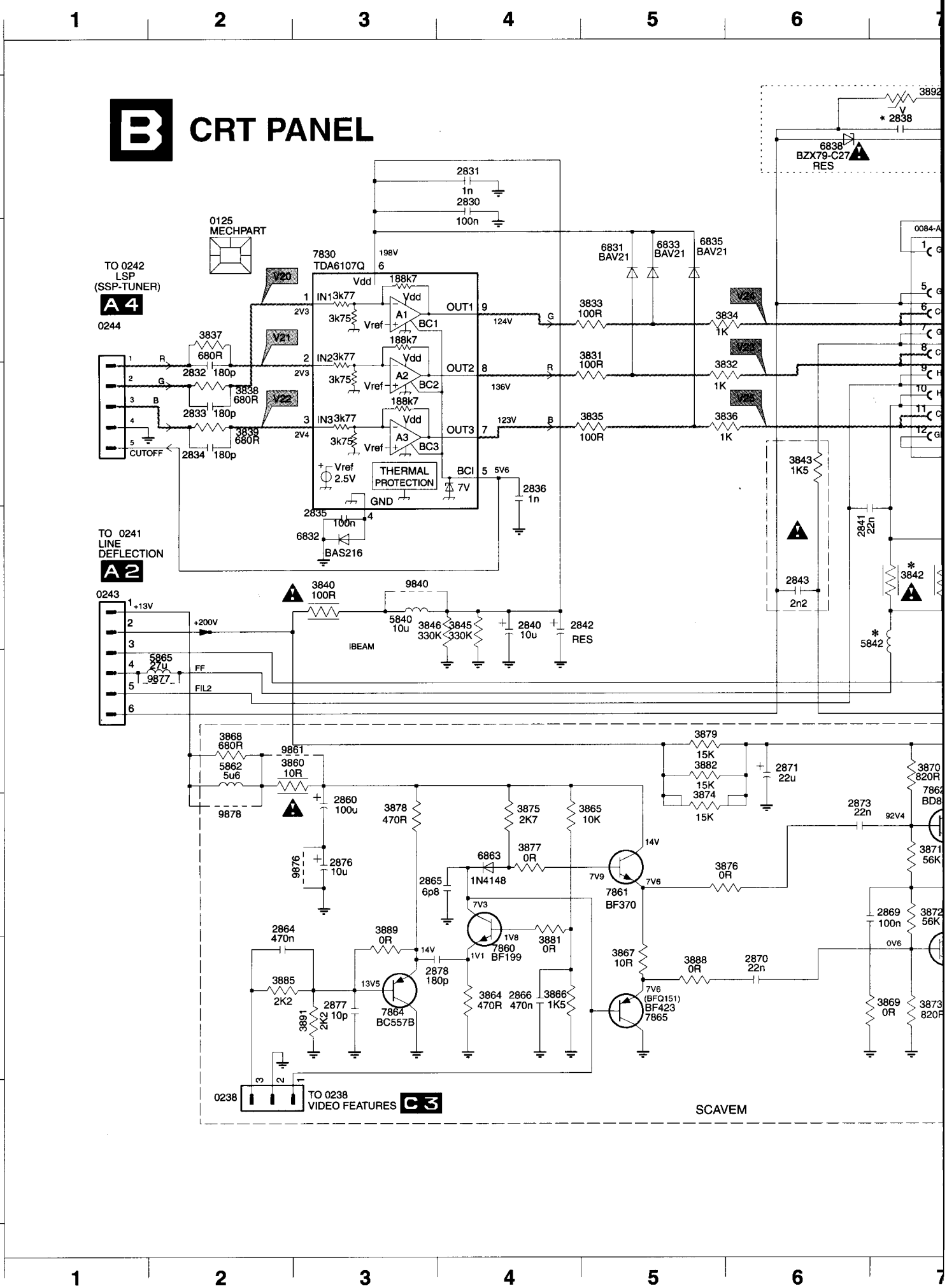

RC5
A4-56
A4-36

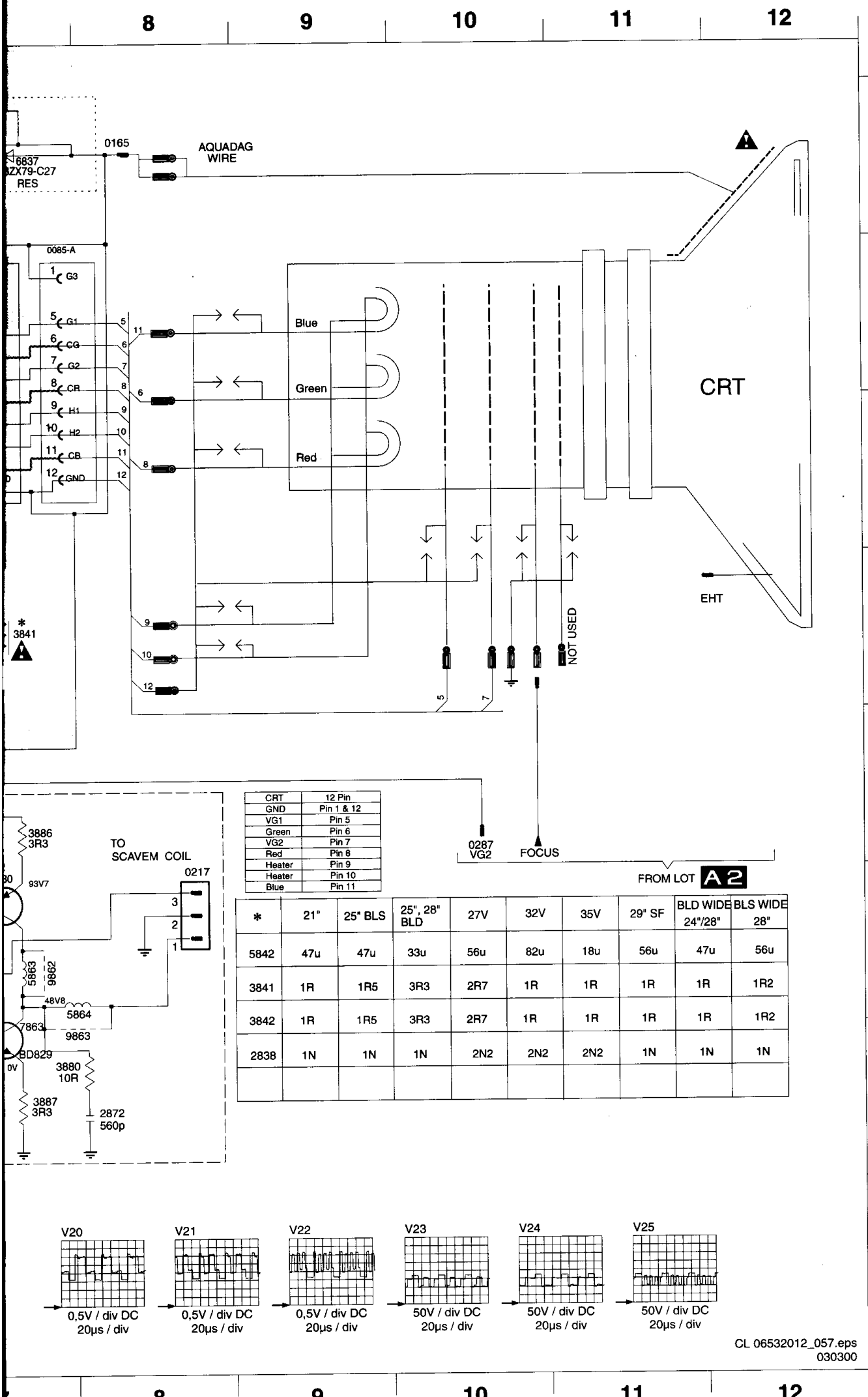
CL 06532012_056.eps
230200



0214 B5
0215 B2
0223 C6
0234 E6
0235 E2
1000 C3
1002 C4
1003 C4
1004 C4
1005 C5
1020 F9
1021 E8
1022 F9
2009 B6
2020 F3
2021 F4
2023 F6
2024 F6
2081 F10
2082 F10
3002 B4
3003 C5
3004 B5
3007 B5
3021 B3
3022 B3
3023 B4
3024 E3
3025 E3
3026 F3
3027 E4
3028 F4
3029 F4
3030 E5
3031 D5
3032 E5
3033 F4
3034 D6
3035 D6
3081 F9
3082 F10
3083 E10
4010 F4
4011 E5
5001 E10
5002 F10
5012 F5
6005 C5
6008 C5
6009 B7
6010 E6
7012 E3
7013 E4
7014 F6
7015 E6
7016 D6
7017 F5
9010 F6
9021 C7
9022 C7
S754 F9

## CRT panel


B CRT PANEL
0125 MECHPART
TO 0242 LSP (SSP-TUNER) A4
0244
7830 TDA6107Q
198V
Vdd
IN1 IN2 IN3
3k75
Vref
A1 A2 A3
BC1 BC2 BC3
OUT1 OUT2 OUT3
124V
136V
123V
THERMAL PROTECTION
GND
BCI
7V
5V6
Vref 2.5V
CUTOFF
TO 0241 LINE DEFLECTION A2
0243
+13V
+200V
FF
FIL2
IBEAM
BAS216
6838 BZX79-C27 RES
6831 BAV21
6833 BAV21
6835 BAV21
3840 100R
9840
5840 10u
3846 330K
3845 330K
2840 10u
2842 RES
3843 1K5
2841 22n
2843 2n2
3842
5842
3868 680R
5862 5u6
9878
9861
3860 10R
2860 100u
9876
2876 10u
3878 470R
3875 2K7
3865 10K
3879 15K
3882 15K
3874 15K
2871 22u
6863 1N4148
3877 0R
2865 6p8
7861 BF370
3876 0R
2873 22n
3870 820R
3871 56K
2869 100n
3872 56K
3869 0R
3873 820R
2864 470n
3889 0R
3885 2K2
2877 10p
3891 2K2
2878 180p
7864 BC557B
3864 470R
2866 470n
3866 1K5
3881 0R
7860 BF199
3867 10R
3888 0R
2870 22n
7865 BF423
3837 680R
3838 680R
3839 680R
2832 180p
2833 180p
2834 180p
2835 100n
2836 1n
2831 1n
2830 100n
3833 100R
3831 100R
3835 100R
3834 1K
3832 1K
3836 1K
0238 TO 0238 VIDEO FEATURES C3
SCAVEM




| CRT | 12 Pin |
|---|---|
| GND | Pin 1 & 12 |
| VG1 | Pin 5 |
| Green | Pin 6 |
| VG2 | Pin 7 |
| Red | Pin 8 |
| Heater | Pin 9 |
| Heater | Pin 10 |
| Blue | Pin 11 |

| * | 21" | 25" BLS | 25", 28" BLD | 27V | 32V | 35V | 29" SF | BLD WIDE 24"/28" | BLS WIDE 28" |
|---|---|---|---|---|---|---|---|---|---|
| 5842 | 47u | 47u | 33u | 56u | 82u | 18u | 56u | 47u | 56u |
| 3841 | 1R | 1R5 | 3R3 | 2R7 | 1R | 1R | 1R | 1R | 1R2 |
| 3842 | 1R | 1R5 | 3R3 | 2R7 | 1R | 1R | 1R | 1R | 1R2 |
| 2838 | 1N | 1N | 1N | 2N2 | 2N2 | 2N2 | 1N | 1N | 1N |
| | | | | | | | | | |

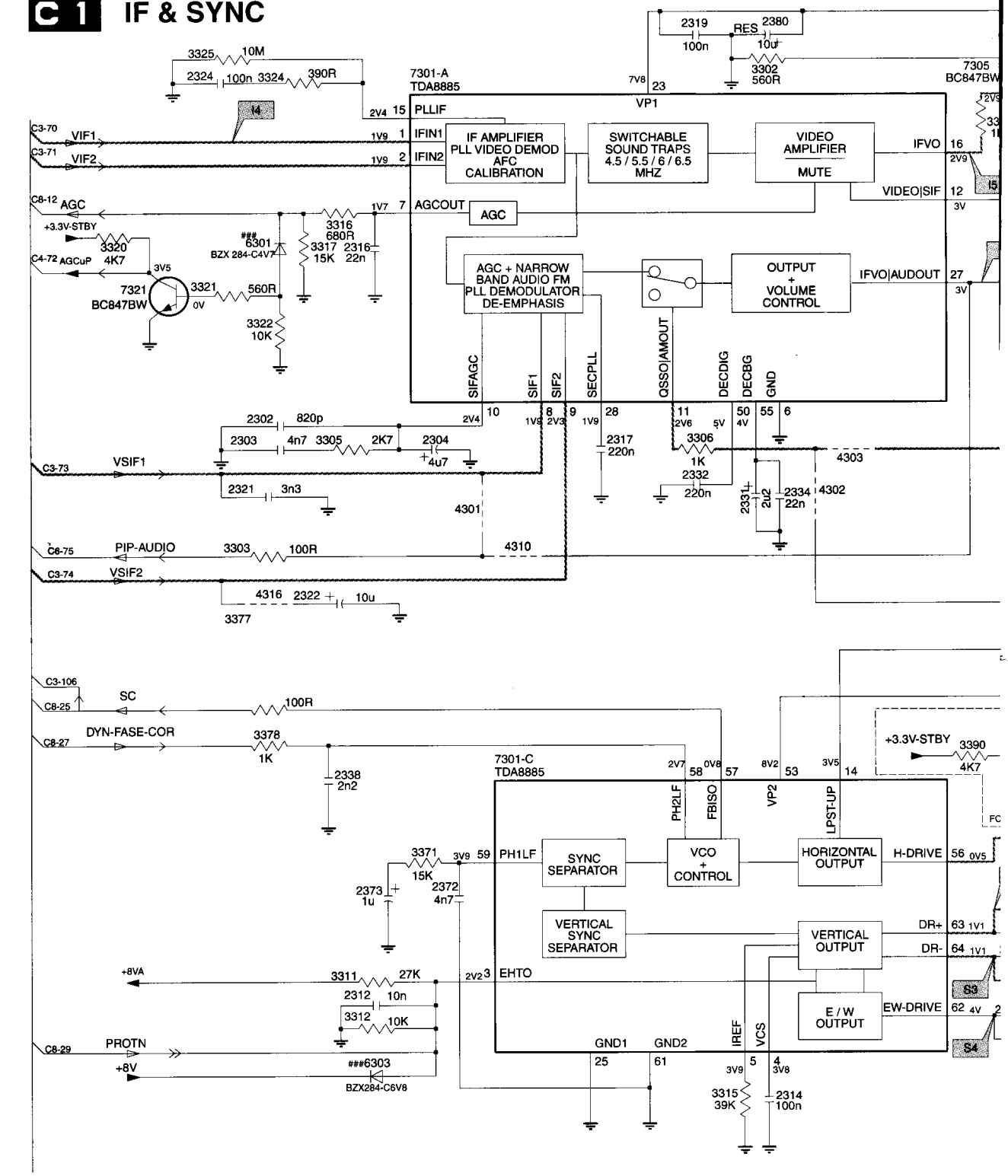


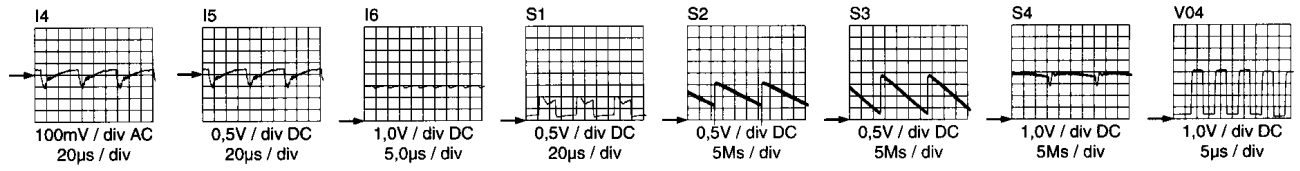

CL 06532012_057.eps
030300

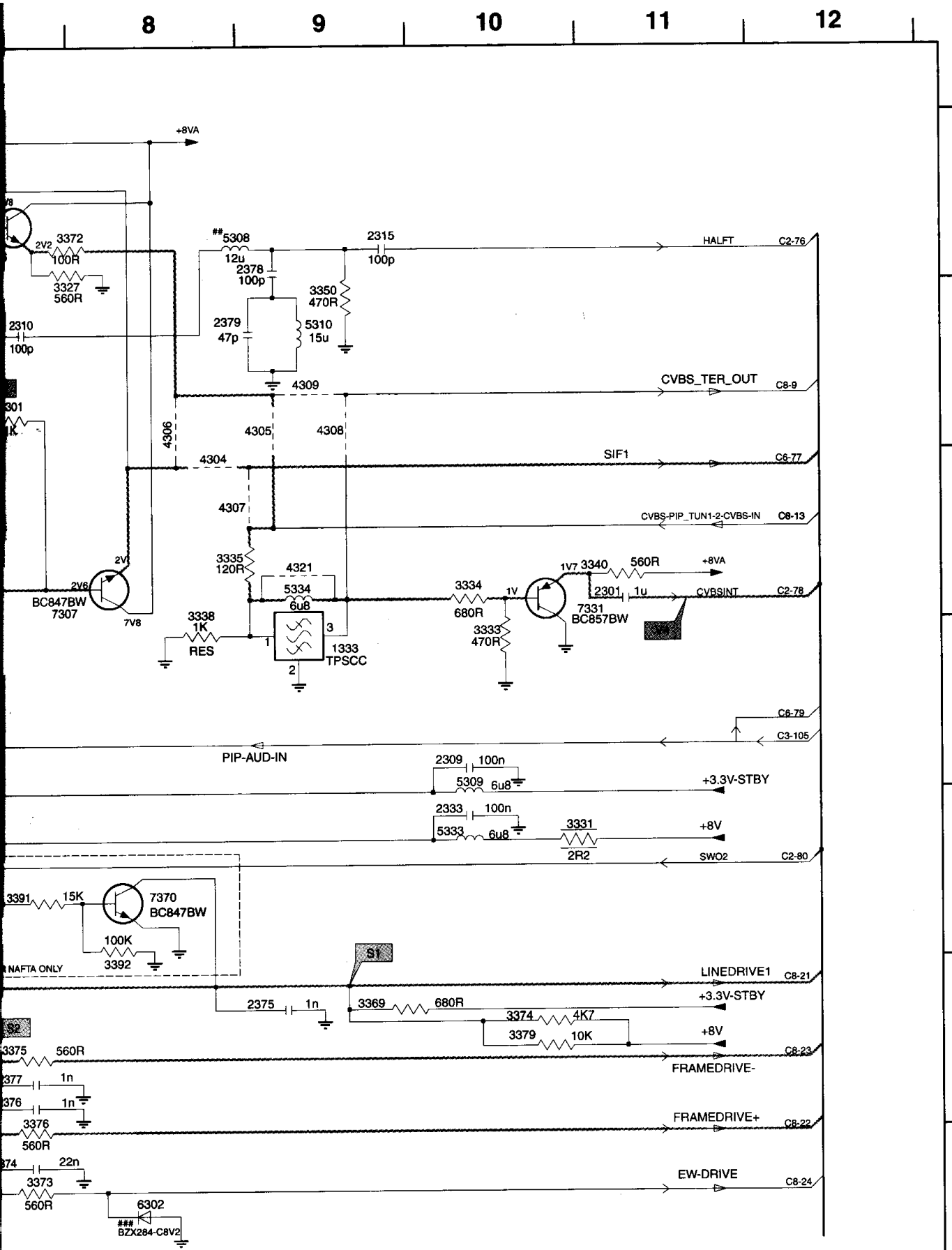

0084-A B7
0085-A B8
0125 B2
0165 A8
0217 F8
0238 H2
0243 D1
0244 B1
0287 E10
2830 A4
2831 A4
2832 C2
2833 C2
2834 C2
2835 D3
2836 C4
2838 A7
2840 D4
2841 D6
2842 D5
2843 D6
2860 F3
2864 F2
2865 F3
2866 G4
2869 F7
2870 G6
2871 E6
2872 G8
2873 F6
2876 F3
2877 G3
2878 G3
3831 B5
3832 C6
3833 B5
3834 B6
3835 C5
3836 C6
3837 B2
3838 C2
3839 C2
3840 D3
3841 D7
3842 D7
3843 C6
3845 D4
3846 D3
3860 E2
3864 G4
3865 F5
3866 G4
3867 G5
3868 E2
3869 G7
3870 E7
3871 F7
3872 F7
3873 G7
3875 F4
3876 F6
3877 F4
3878 F3
3879 E5
3880 G7
3881 G4
3882 F5
3885 G2
3886 E7
3887 G7
3888 G5
3889 F3
3891 G3
3892 A7
5840 D3
5842 D7
5862 E2
5863 F7
5864 F8
5865 E2
6831 B5
6832 D3
6833 B5
6835 B5
6837 A7
6838 A6
6863 F4
7830 B3
7860 G4
7861 F5
7862 E7
7863 G7
7864 G3
7865 G5
9840 D3
9861 E2
9862 F7
9863 G7
9876 F3
9877 E2
9878 F2

# IF & SYNC

## C 1 IF & SYNC



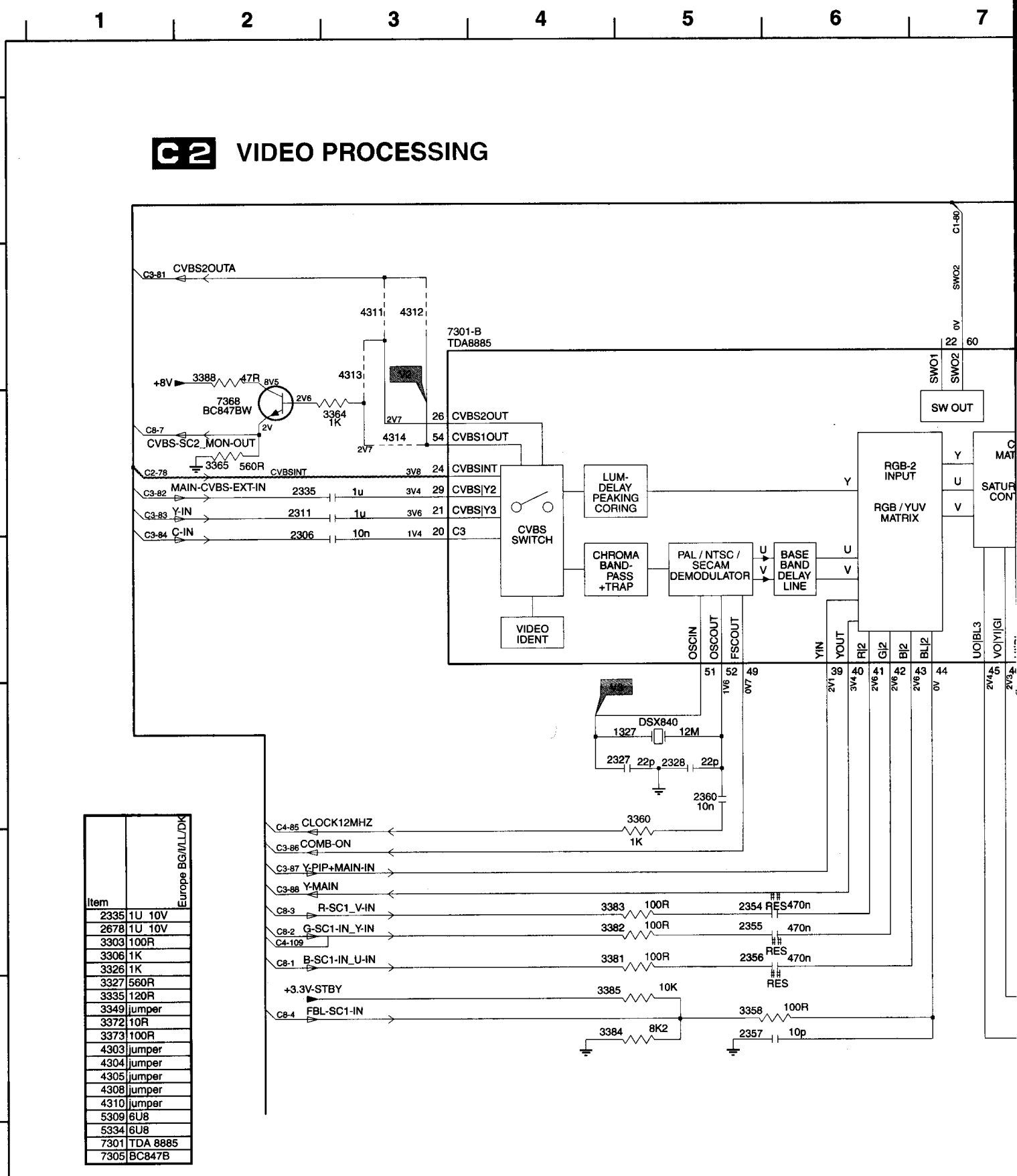





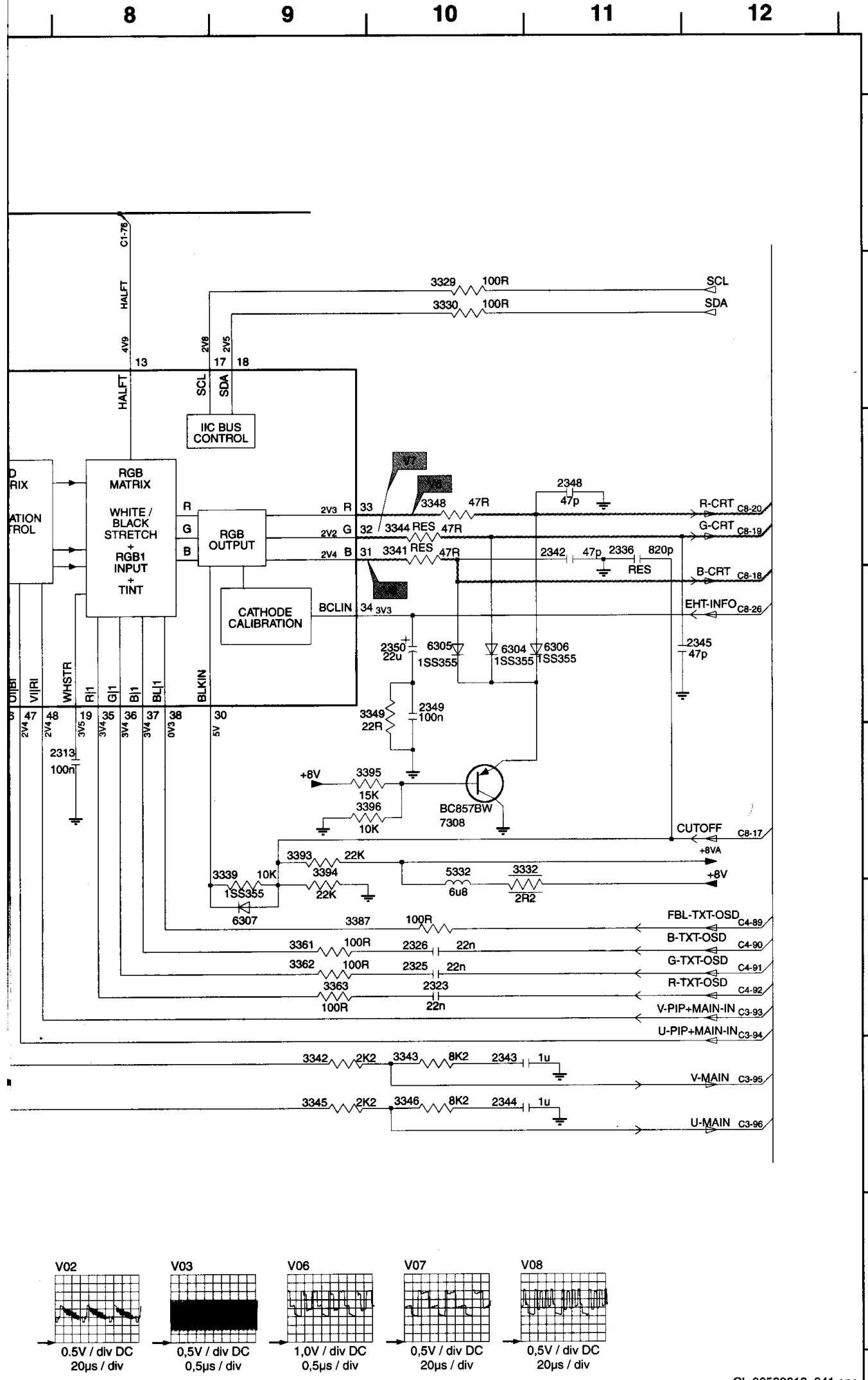

CL 06532012_040.eps
030300

1333 D10
2301 D11
2302 C3
2303 C2
2304 C4
2309 D10
2310 B8
2312 G3
2314 G6
2315 A10
2316 B3
2317 C5
2319 A5
2321 D2
2322 E3
2324 A2
2331 D6
2332 D5
2333 E10
2334 D6
2338 E3
2372 F4
2373 F3
2374 G7
2375 F9
2376 F7
2377 F7
2378 A10
2379 B10
2380 A6
3301 B8
3302 A6
3303 D2
3305 C3
3306 C6
3311 G3
3312 G3
3315 G5
3316 B3
3317 B3
3320 B2
3321 B2
3322 C3
3324 A3
3325 A2
3326 A8
3327 B9
3331 E11
3333 D10
3334 D10
3335 C9
3338 D9
3340 C11
3350 B10
3369 F9
3371 F4
3372 A9
3373 G7
3374 F10
3375 F7
3376 F7
3377 E2
3378 E3
3379 F10
3390 E7
3391 E7
3392 F8
4301 D4
4302 D7
4303 C7
4304 C9
4305 C9
4306 B9
4307 C9
4308 C10
4309 B9
4310 D4
4316 E3
4321 C9
5308 A10
5309 D10
5310 B10
5333 E10
5334 D9
6301 B3
6302 G8
6303 G3
7301-A A3
7301-C E4
7305 B8
7307 C8
7321 B2
7331 D10
7370 E8

## Video processing

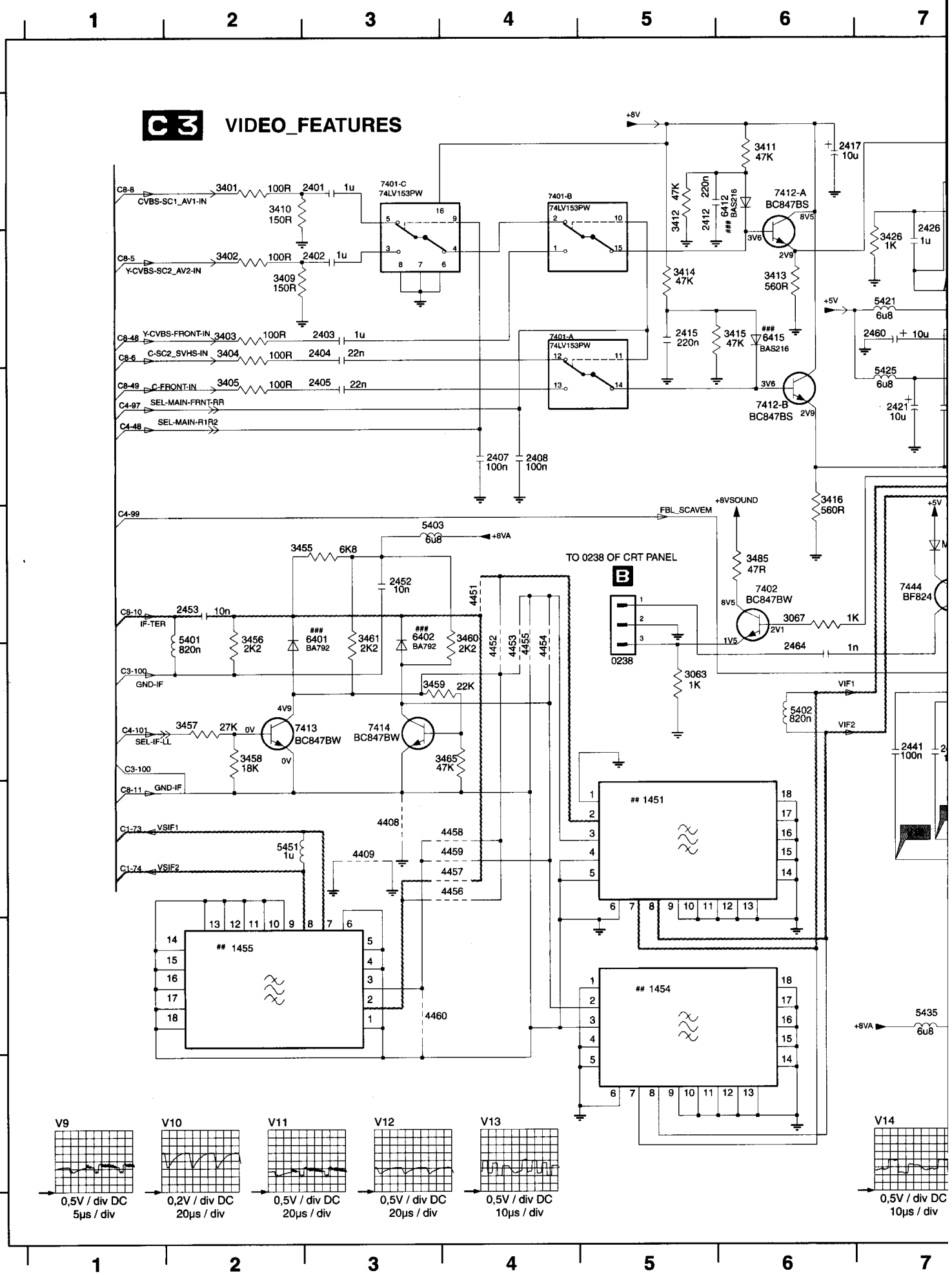


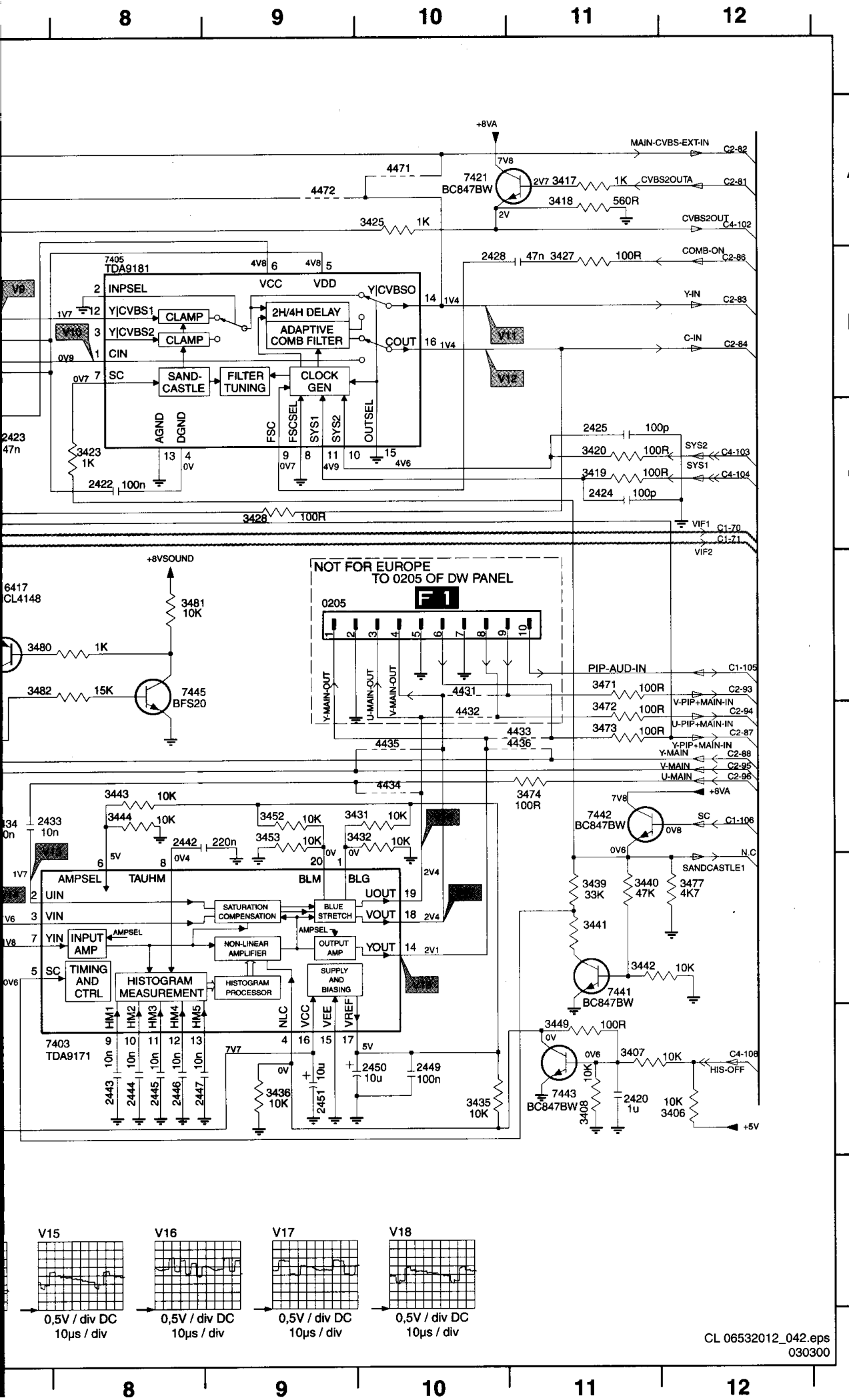

| Item | Europe BG/I/LL'/DK |
|---|---|
| 2335 | 1U 10V |
| 2678 | 1U 10V |
| 3303 | 100R |
| 3306 | 1K |
| 3326 | 1K |
| 3327 | 560R |
| 3335 | 120R |
| 3349 | jumper |
| 3372 | 10R |
| 3373 | 100R |
| 4303 | jumper |
| 4304 | jumper |
| 4305 | jumper |
| 4308 | jumper |
| 4310 | jumper |
| 5309 | 6U8 |
| 5334 | 6U8 |
| 7301 | TDA 8885 |
| 7305 | BC847B |




1327 E5
2306 D2
2311 C2
2313 E8
2323 F10
2325 F10
2326 F10
2327 E5
2328 E5
2335 C2
2336 C11
2342 C11
2343 G10
2344 G10
2345 D12
2348 C11
2349 D10
2350 D10
2354 F5
2355 F5
2356 F5
2357 G5
2360 E5
3329 B10
3330 B10
3332 E10
3339 E9
3341 C10
3342 G9
3343 G10
3344 C10
3345 G9
3346 G10
3348 C10
3349 D10
3358 G5
3360 E3
3361 F9
3362 F9
3363 F9
3364 C3
3365 C2
3381 F4
3382 F4
3383 F4
3384 G4
3385 G4
3387 F9
3388 B2
3393 E9
3394 E9
3395 E10
3396 E10
4311 B3
4312 B3
4313 B3
4314 C3
5332 E10
6304 D10
6305 D10
6306 D11
6307 F9
7301-B B3
7308 E10
7368 C2

# Video features






0205 D10
0238 E5
1451 F5
1454 G5
1455 G2
2401 A3
2402 B3
2403 B3
2404 B3
2405 C3
2407 C4
2408 C4
2412 A5
2415 B5
2417 A6
2420 G11
2421 C7
2422 C8
2423 C7
2424 C11
2425 C11
2426 A7
2428 B10
2433 E7
2434 E7
2441 E7
2442 E8
2443 G8
2444 G8
2445 G8
2446 G8
2447 G8
2449 G10
2450 G10
2451 G9
2452 D3
2453 D2
2460 B7
2464 E6
3063 E5
3067 D6
3401 A2
3402 B2
3403 B2
3404 B2
3405 C2
3406 G12
3407 G11
3408 G11
3409 B2
3410 A2
3411 A6
3412 A5
3413 B6
3414 B5
3415 B6
3416 C6
3417 A11
3418 A11
3419 C11
3420 C11
3423 C8
3425 A10
3426 B7
3427 B11
3428 C9
3431 E10
3432 E10
3435 G10
3436 G9
3439 F11
3440 F11
3441 F11
3442 F11
3443 E8
3444 E8
3449 G11
3452 E9
3453 E9
3455 D2
3456 D2
3457 E2
3458 E2
3459 E3
3460 D4
3461 D3
3465 F4
3471 D11
3472 E11
3473 E11
3474 E11
3477 F12
3480 D7
3481 D8
3482 D7
3485 D6
4408 F3
4409 F3
4431 D10
4432 E10
4433 E10
4434 E10
4435 E10
4436 E10
4451 D4
4452 D4
4453 D4
4454 D4
4455 D4
4456 F4
4457 F4
4458 F4
4459 F4
4460 G3
4471 A10
4472 A9
5401 D2
5402 E6
5403 D3
5421 B7
5425 C7
5435 G7
5451 F2
6401 E3
6402 D3
6412 A6
6415 B6
6417 D7
7401 A3
7402 D6
7403 G7
7405 B8
7412-A A6
7412-B C6
7413 E2
7414 E3
7421 A10
7441 F11
7442 E11
7443 G11
7444 D7
7445 D8

## Diversity tables SSB panel

### Diversity tables diagram C3

| Item | Histogram No PIP/DW | No Histogram/PIP/DW |
|---|---|---|
| 2420 | 100P 50V | , |
| 2433 | 10N 50V | , |
| 2434 | 10N 50V | , |
| 2441 | 100N 16V | , |
| 2442 | 220N 16V | , |
| 2443 | 10N 50V | , |
| 2444 | 10N 50V | , |
| 2445 | 10N 50V | , |
| 2446 | 10N 50V | , |
| 2447 | 10N 50V | , |
| 2449 | 100N 16V | , |
| 2450 | 10U 16V | , |
| 2451 | 10U 16V | , |
| 3406 | 10K | , |
| 3407 | 10K | , |
| 3408 | 10K | , |
| 3432 | jumper | , |
| 3435 | 22K | , |
| 3436 | 33K | , |
| 3439 | 10K | , |
| 3443 | jumper | , |
| 3444 | 220K | , |
| 3453 | jumper | , |
| 3477 | 4K7 | , |
| 3477 | , | 4K7 |
| 4434 | , | jumper |
| 4435 | , | jumper |
| 4436 | , | jumper |
| 5435 | 6U8 | , |
| 7403 | TDA9171 | , |
| 7443 | BC847 | , |

| Item | SAW filter EU BG/I/LL/DK |
|---|---|
| 1451 | OFWK3953L |
| 1454 | - |
| 1455 | OFWK9656L |
| 2452 | 10N 50V |
| 3455 | 6K8 |
| 3456 | 2K2 |
| 3457 | 27K |
| 3458 | 18K |
| 3459 | - |
| 3460 | - |
| 3461 | 2K2 |
| 3465 | - |
| 4451 | jumper |
| 4452 | - |
| 4453 | - |
| 4455 | jumper |
| 4457 | jumper |
| 4458 | jumper |
| 4460 | - |
| 5403 | 6U8 |
| 6401 | 1SS356 |
| 6402 | - |
| 7413 | BC847BW |
| 7414 | - |

### Diversity table diagram C4

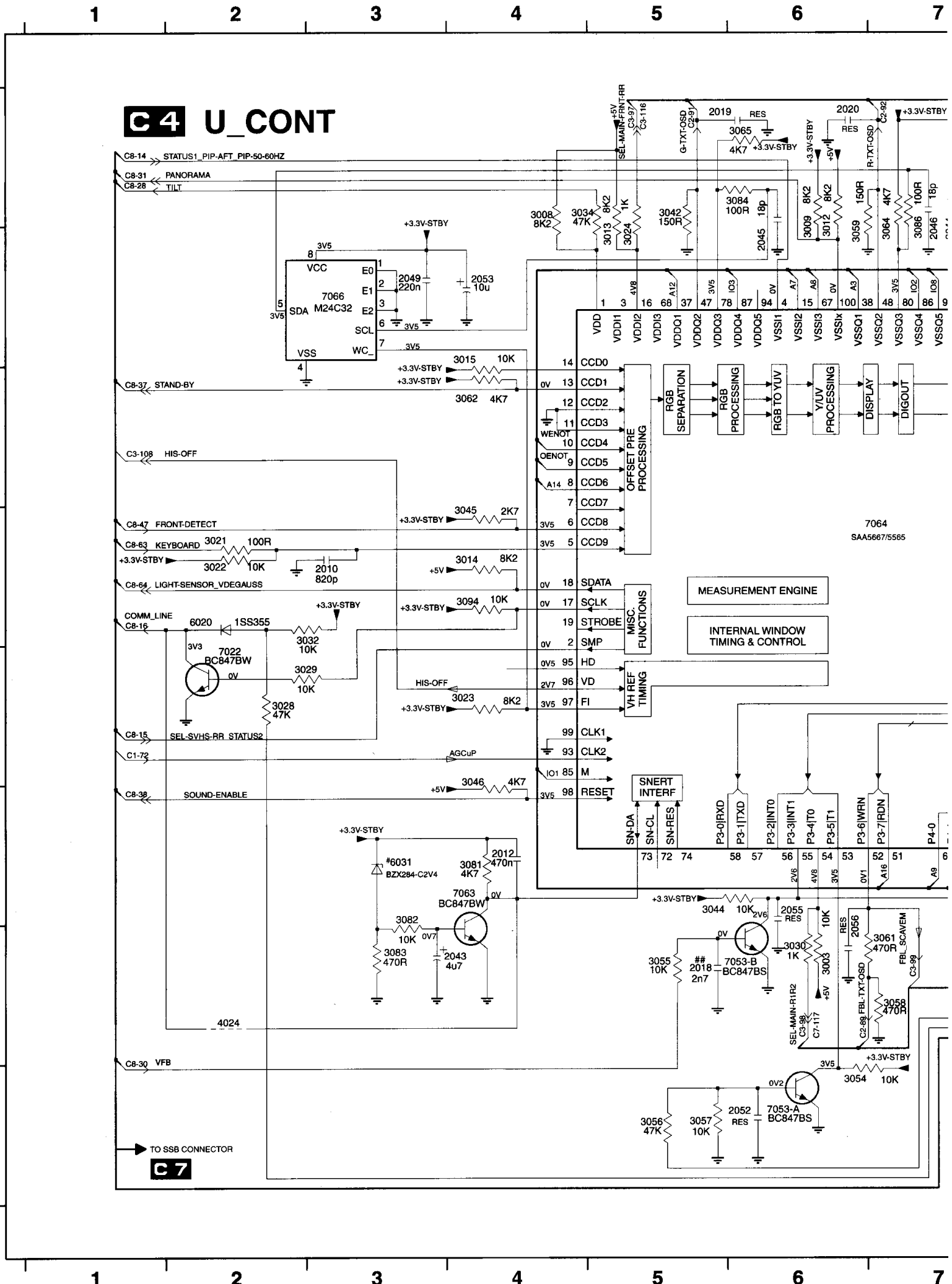
| Item | West EU 100Pg Txt | West EU 10Pg Txt | East EU 10Pg Txt | |
|---|---|---|---|---|
| 2058 | 100N 16V | , | , | 10 |
| 3028 | 47K | , | , | 47 |
| 3029 | 10K | , | , | 10 |
| 3032 | 10K | , | , | 10 |
| 3033 | 10K | , | , | 10 |
| 3090 | 10K | , | , | 10 |
| 3091 | 10K | , | , | 10 |
| 3094 | 10K | , | , | 10 |
| 5050 | 5U6 | , | , | 5U |
| 6020 | 1SS355 | , | , | 1S |
| 7022 | BC847 | , | , | BC |
| 7070 | UPD431000 | , | , | UP |

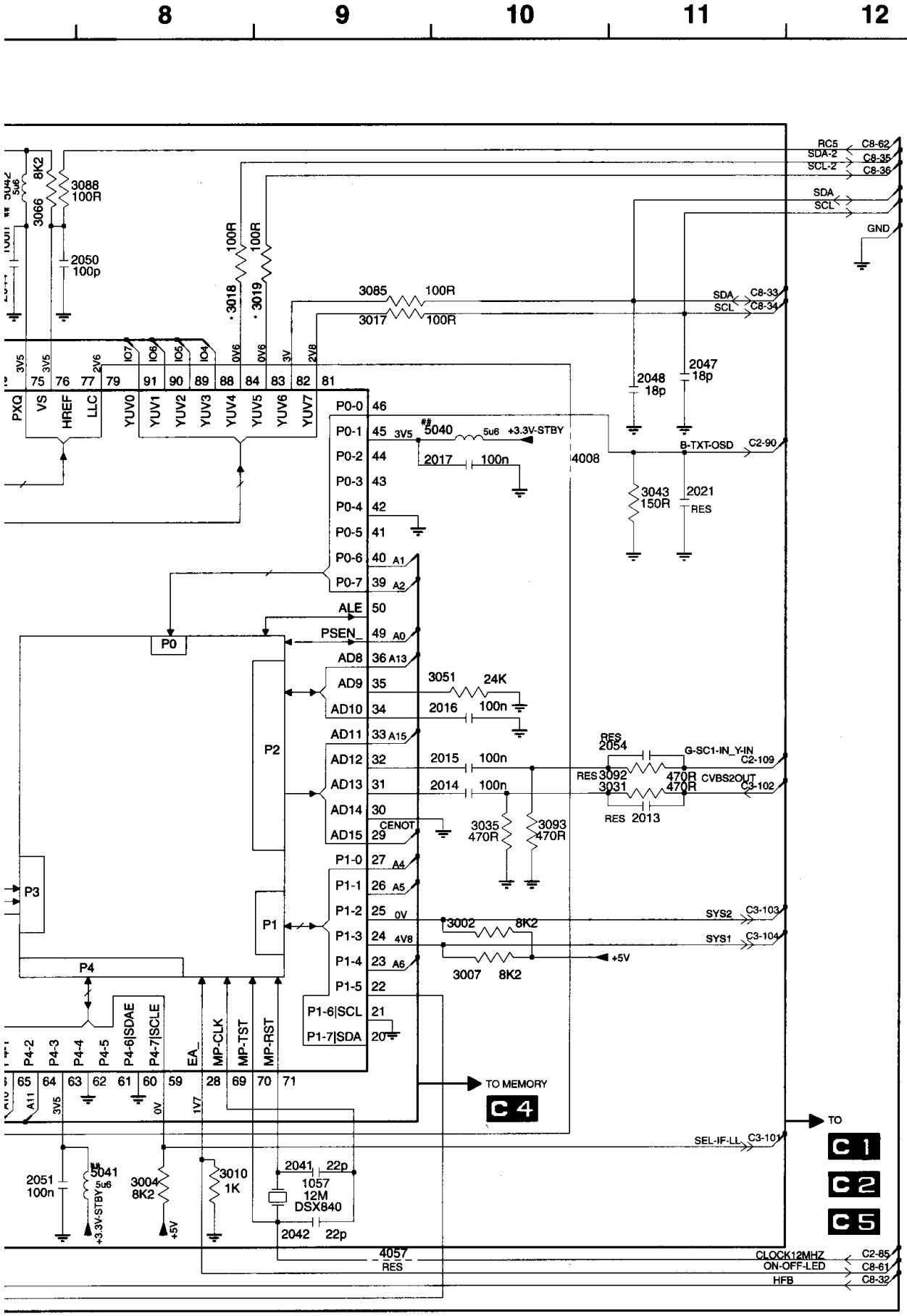
# Diversity table diagram C7

| Item | Virtual Dolby EU | Incredible Surround E | East EU 100Pg Txt |
|---|---|---|---|
| 2631 | 1U 10V | , | |
| 2633 | 1U 10V | , | |
| 2643 | , | 1U 10V | |
| 2646 | , | 1U 10V | |
| 2679 | , | 100N 16V | |
| 2682 | , | 1U 10V | |
| 2683 | , | 1U 10V | |
| 2684 | , | 1U 10V | |
| 2685 | , | 1U 10V | |
| 2686 | , | 1U 10V | |
| 2687 | , | 1U 10V | |
| 2690 | , | 1U 10V | |
| 2691 | , | 1U 10V | |
| 3643 | , | 56K | |
| 3644 | , | 100K | |
| 3645 | , | 1K | |
| 3646 | , | 56K | |
| 3647 | , | 100K | |
| 3648 | , | 1K | |
| 3680 | , | 10R | |
| 3681 | , | 10R | |
| 4640 | jumper | , | |
| 4642 | jumper | , | |
| 7630 | , | 74HC4052 | |
| 7645 | , | BC847B | |

CL 06532012_061.eps
100300

## U Cont

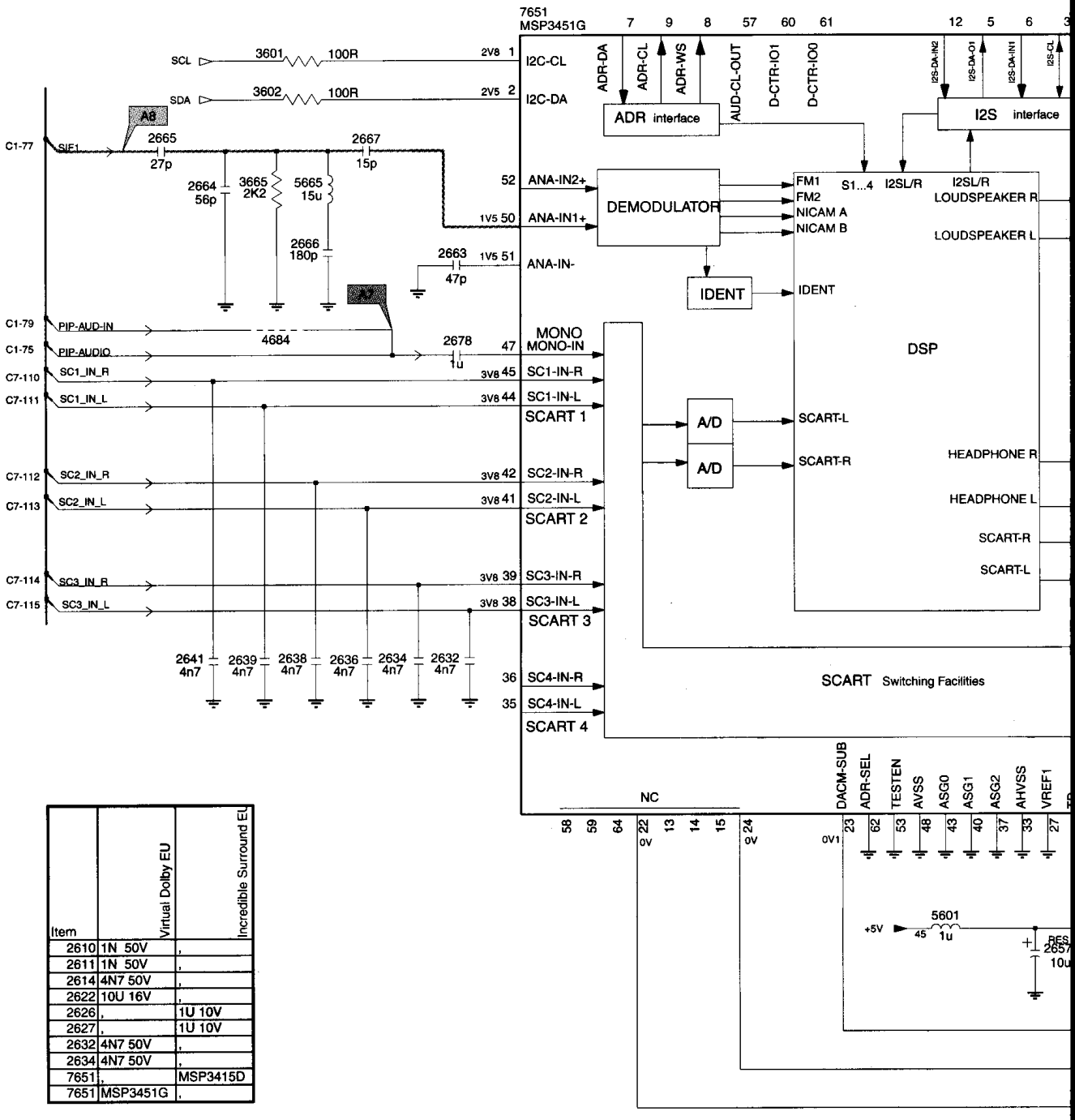

C4 U_CONT
C8-14 STATUS1_PIP-AFT_PIP-50-60HZ
C8-31 PANORAMA
C8-28 TILT
C8-37 STAND-BY
C3-108 HIS-OFF
C8-47 FRONT-DETECT
C8-63 KEYBOARD
C8-64 LIGHT-SENSOR_VDEGAUSS
COMM_LINE
C8-16
C8-15 SEL-SVHS-RR STATUS2
C1-72
C8-38 SOUND-ENABLE
C8-30 VFB
4024
TO SSB CONNECTOR
C7
7066 M24C32
VCC
VSS
SDA
SCL
WC_
E0
E1
E2
7064 SAA5667/5565
OFFSET PRE PROCESSING
RGB SEPARATION
RGB PROCESSING
RGB TO YUV
Y/UV PROCESSING
DISPLAY
DIGOUT
MISC. FUNCTIONS
VH REF TIMING
MEASUREMENT ENGINE
INTERNAL WINDOW TIMING & CONTROL
SNERT INTERF
SEL-MAIN-FRNT-RR
G-TXT-OSD
R-TXT-OSD
FBL-TXT-OSD
FBL_SCAVEM
SEL-MAIN-R1R2
7053-A BC847BS
7053-B BC847BS
7063 BC847BW
7022 BC847BW
#6031 BZX284-C2V4
1SS355
+3.3V-STBY
+5V
0V



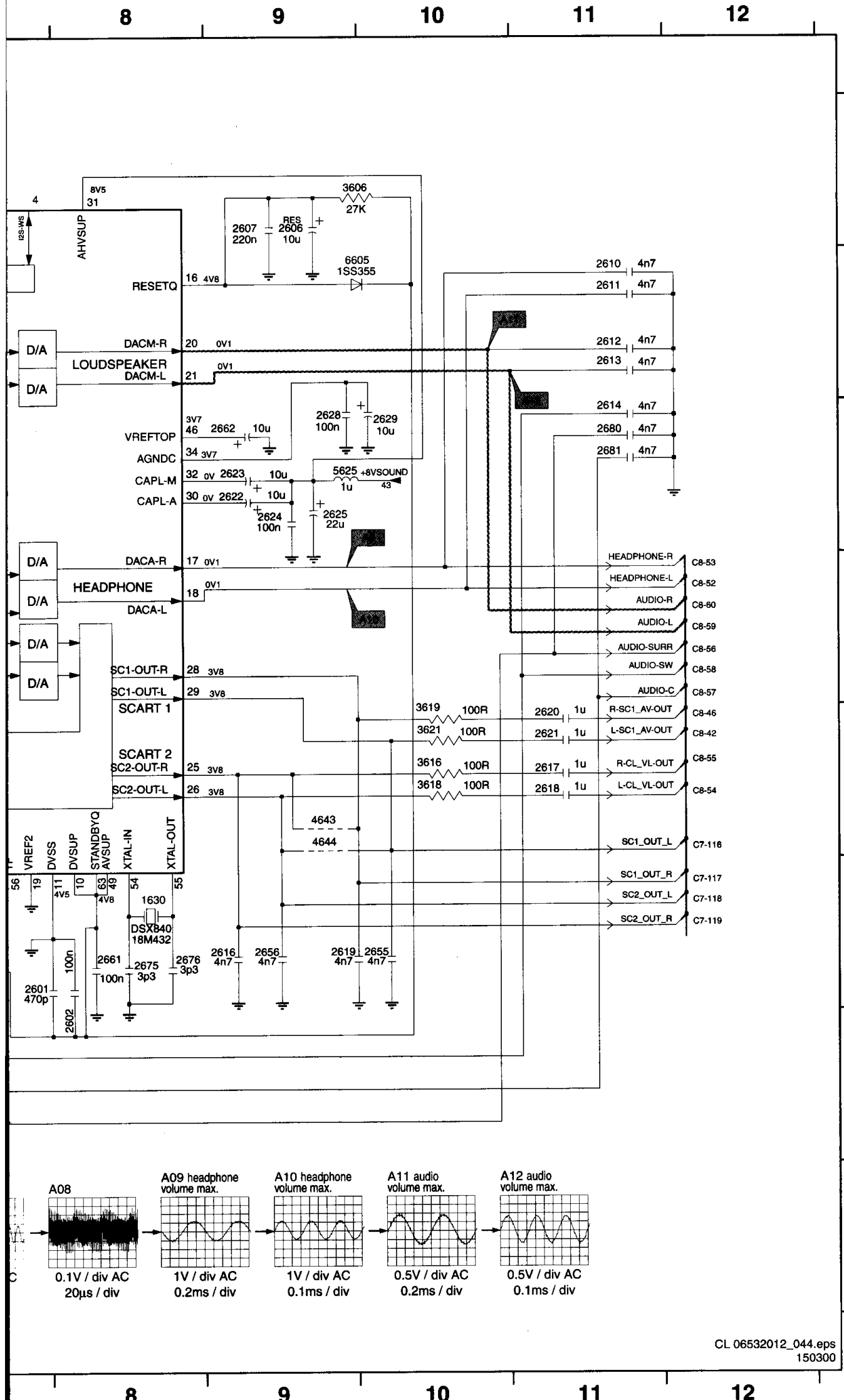

1057 G9
2010 D3
2012 F4
2013 E11
2014 D10
2015 D10
2016 D10
2017 B10
2018 G5
2019 A5
2020 A6
2021 C11
2041 G9
2042 G9
2043 G4
2044 B7
2045 B6
2046 B7
2047 B11
2048 B11
2049 B3
2050 B8
2051 G7
2052 H6
2053 B4
2054 D11
2055 F6
2056 G6
3002 E10
3003 G6
3004 G8
3007 E10
3008 B4
3009 B6
3010 G8
3012 A6
3013 B5
3014 D4
3015 B4
3017 B9
3018 B8
3019 B9
3021 D2
3022 D2
3023 E4
3024 B5
3028 D2
3029 E2
3030 G6
3031 D11
3032 D3
3034 B5
3035 E10
3042 B5
3043 C11
3044 F5
3045 D4
3046 E4
3051 D10
3054 H6
3055 G5
3056 H5
3057 H5
3058 G7
3059 B6
3061 G7
3062 C4
3064 B7
3065 A6
3066 A7
3081 F4
3082 F3
3083 G3
3084 A6
3085 B9
3086 B7
3088 A7
3092 D11
3093 E10
3094 D4
4008 B10
4024 G2
4057 G9
5040 B10
5041 G8
5042 A7
6020 D2
6031 F3
7022 E2
7053-A H6
7053-B G5
7063 F4
7064 D7
7066 B3

## Audio processing

# C6 AUDIO PROCESSING




| Item | Virtual Dolby EU | Incredible Surround EU |
|---|---|---|
| 2610 | 1N 50V | , |
| 2611 | 1N 50V | , |
| 2614 | 4N7 50V | , |
| 2622 | 10U 16V | , |
| 2626 | , | 1U 10V |
| 2627 | , | 1U 10V |
| 2632 | 4N7 50V | , |
| 2634 | 4N7 50V | , |
| 7651 | , | MSP3415D |
| 7651 | MSP3451G | , |

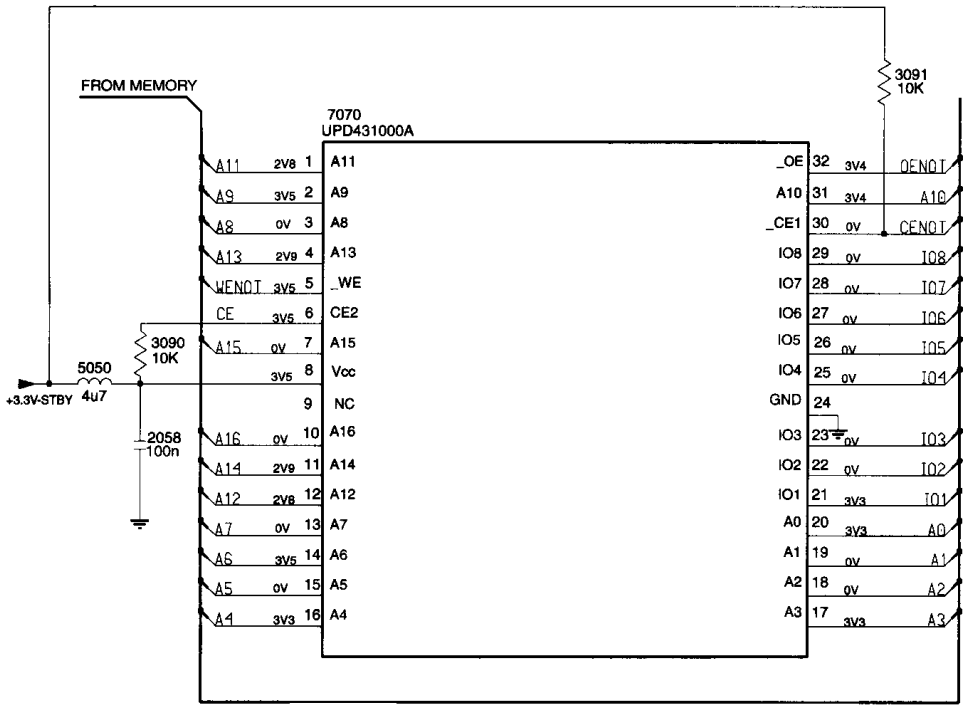



1630 F8
2601 G7
2602 G8
2606 A9
2607 A9
2610 B11
2611 B11
2612 B11
2613 B11
2614 C11
2616 F9
2617 E11
2618 E11
2619 F10
2620 E11
2621 E11
2622 C9
2623 C9
2624 C9
2625 C10
2628 C9
2629 C9
2632 E4
2634 E3
2636 E3
2638 E3
2639 E3
2641 E2
2655 F10
2656 F9
2657 F7
2661 F8
2662 C9
2663 C4
2664 B2
2665 B2
2666 B3
2667 B3
2675 F8
2676 F8
2678 C4
2680 C11
2681 C11
3601 A3
3602 B3
3606 A10
3616 E10
3618 E10
3619 E10
3621 E10
3665 B3
4643 E10
4644 E9
4684 C3
5601 F6
5625 C10
5665 B3
6605 B10
7651 A4

## Memory

2058 D2
3090 D2
3091 C6
5050 D2
7070 C3

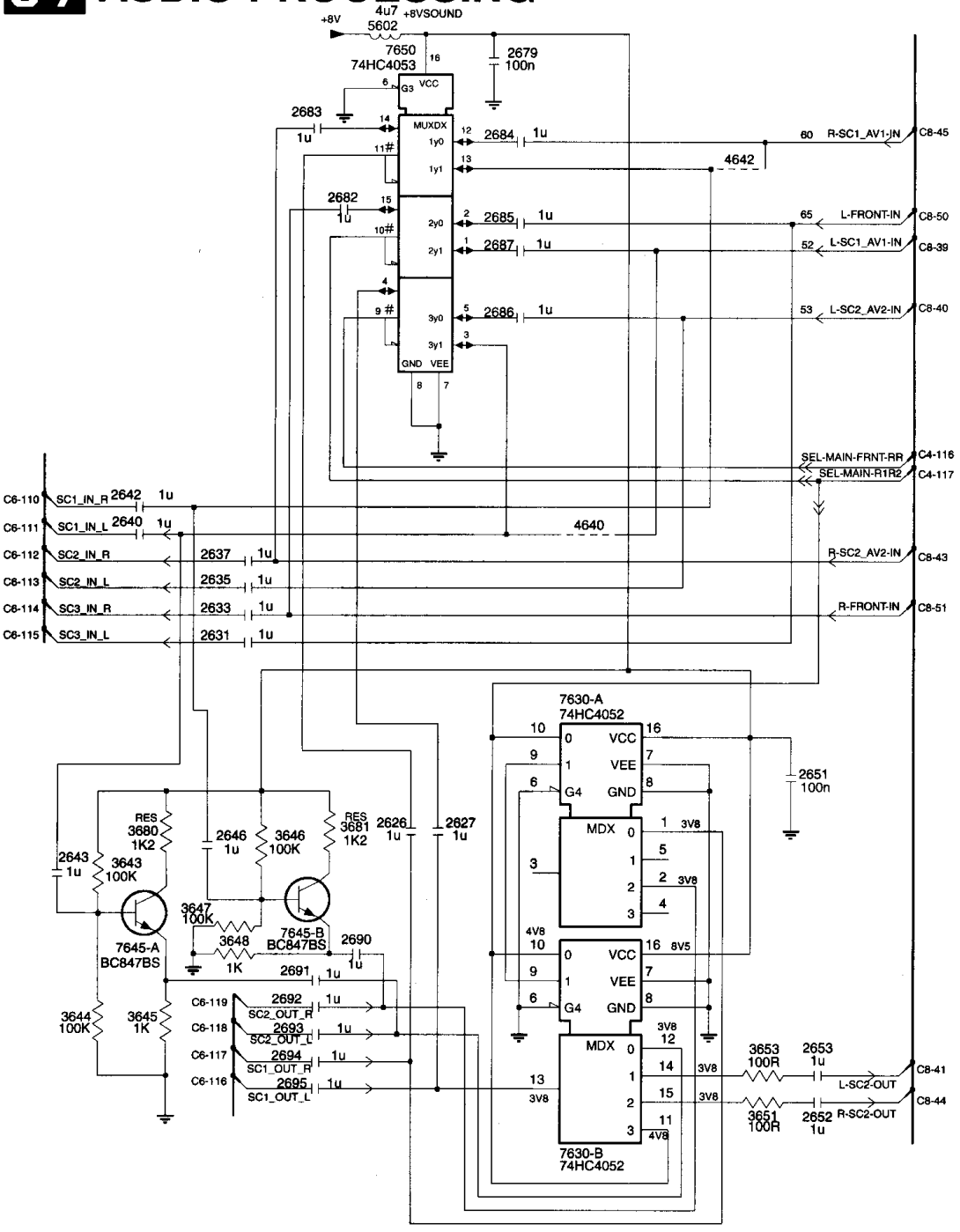
# C5 MEMORY




| Item | West EU 100Pg Txt | West EU 10Pg Txt | East EU 10Pg Txt | East EU 100Pg Txt |
|---|---|---|---|---|
| 2058 | 100N 16V | , | , | 100N 16V |
| 3028 | 47K | , | , | 47K |
| 3029 | 10K | , | , | 10K |
| 3032 | 10K | , | , | 10K |
| 3033 | 10K | , | , | 10K |
| 3090 | 10K | , | , | 10K |
| 3091 | 10K | , | , | 10K |
| 3094 | 10K | , | , | 10K |
| 5050 | 5U6 | , | , | 5U6 |
| 6020 | 1SS355 | , | , | 1SS355 |
| 7022 | BC847 | , | , | BC847 |
| 7070 | UPD431000 | , | , | UPD431000 |

CL 06532012_045.eps
290200

# C7 AUDIO PROCESSING




CL 06532012_047.eps
220200

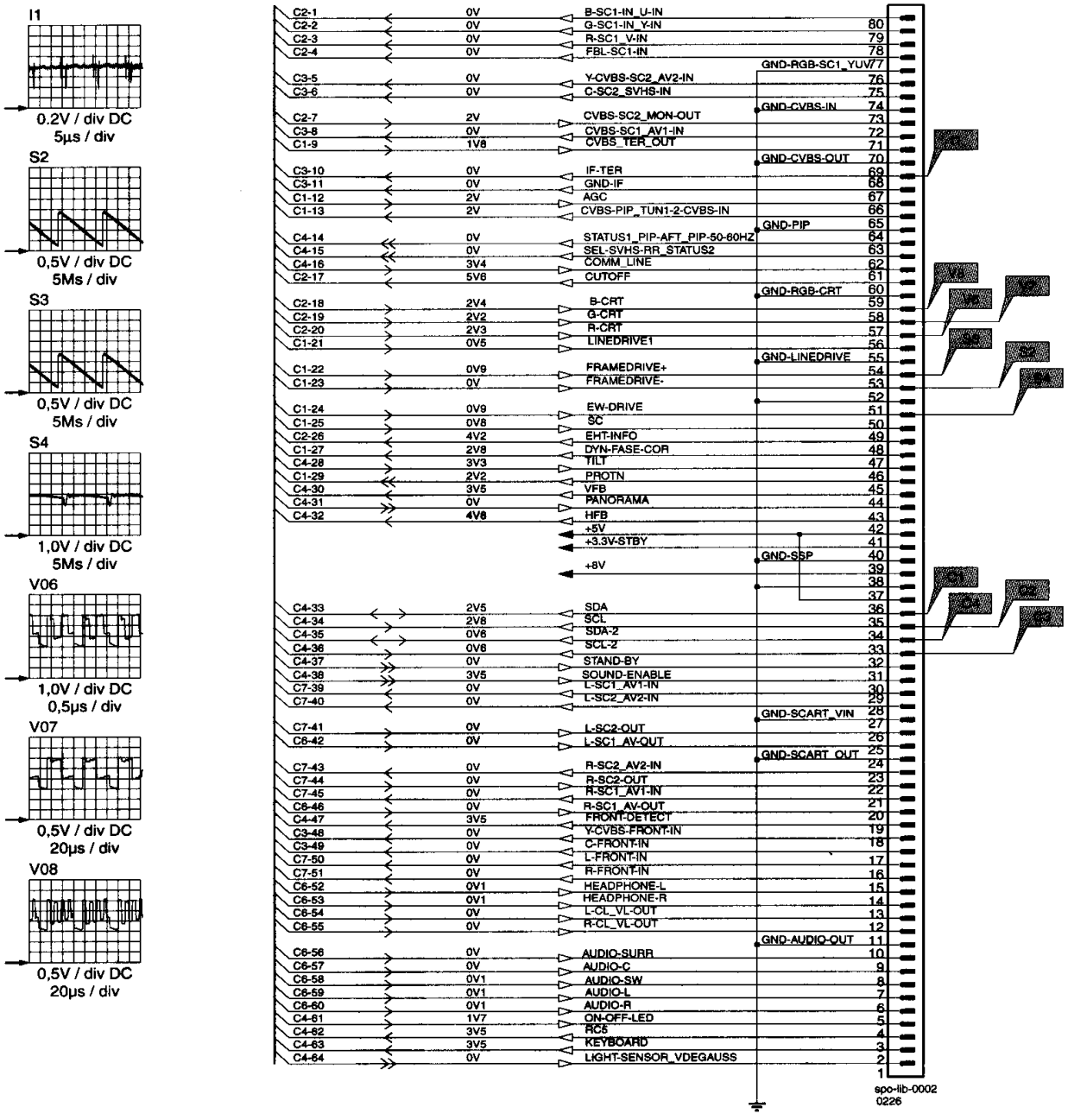
2626 E3
2627 E3
2631 D2
2633 D2
2635 D2
2637 D2
2640 D2
2642 D2
2643 E2
2646 E2
2651 E5
2652 G5
2653 F5
2679 A4
2682 B3
2683 A3
2684 B4
2685 B4
2686 B4
2687 B4
2690 F3
2691 F3
2692 F3
2693 F3
2694 F3
2695 G3
3643 E2
3644 F2
3645 F2
3646 E3
3647 F2
3648 F2
3651 G5
3653 F5
3680 E2
3681 E3
4640 D4
4642 B5
5602 A3
7630 A3
7645-A F2
7645-B F3
7650-A D4
7650-B G4

# SSB connector

0226 G5

## C 8 SSB_CONNECTOR

TO 0226 OF SSP TUNER A 4 (S30)

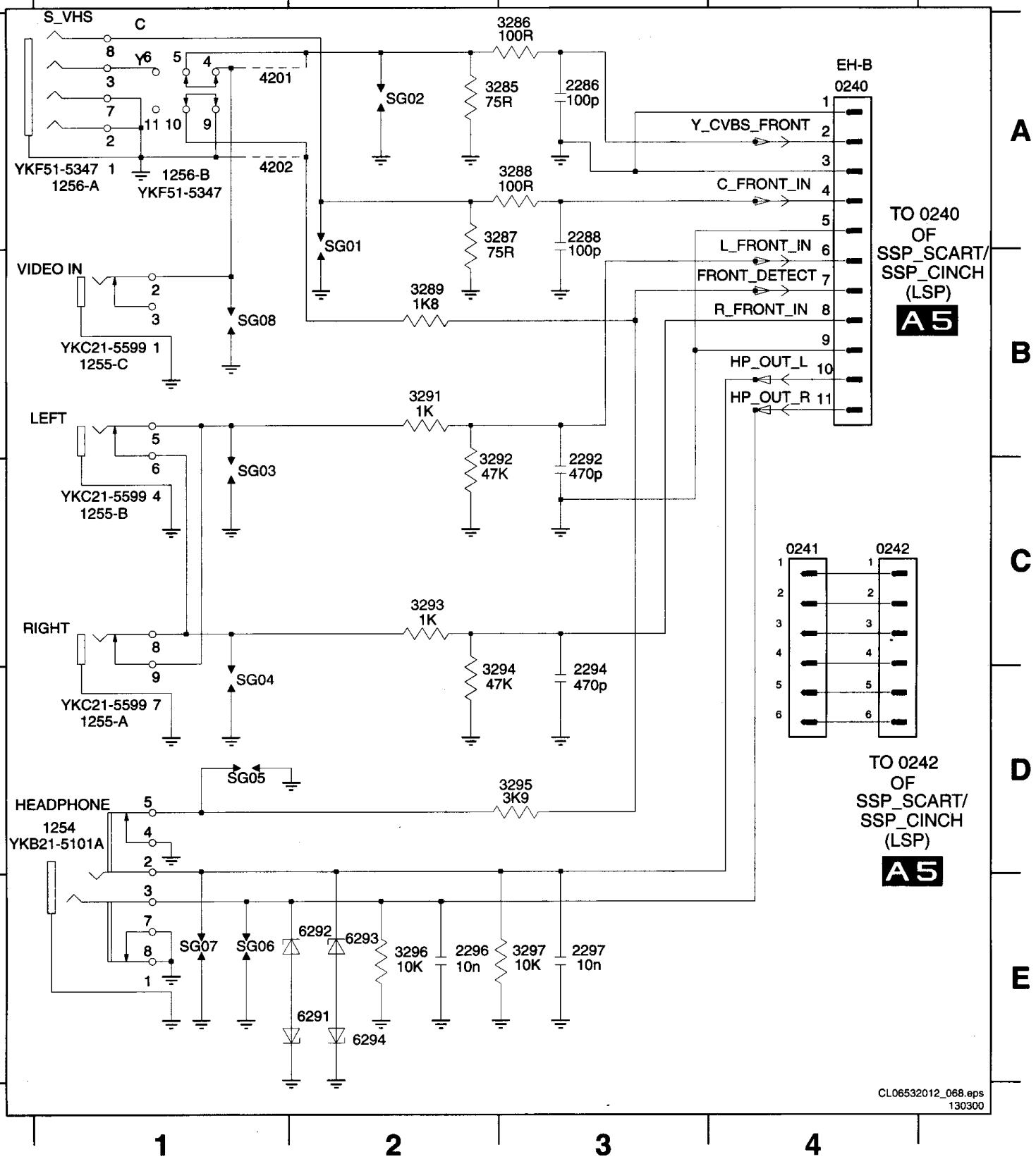



CL 06532012_046.eps
150300

## Side I/O

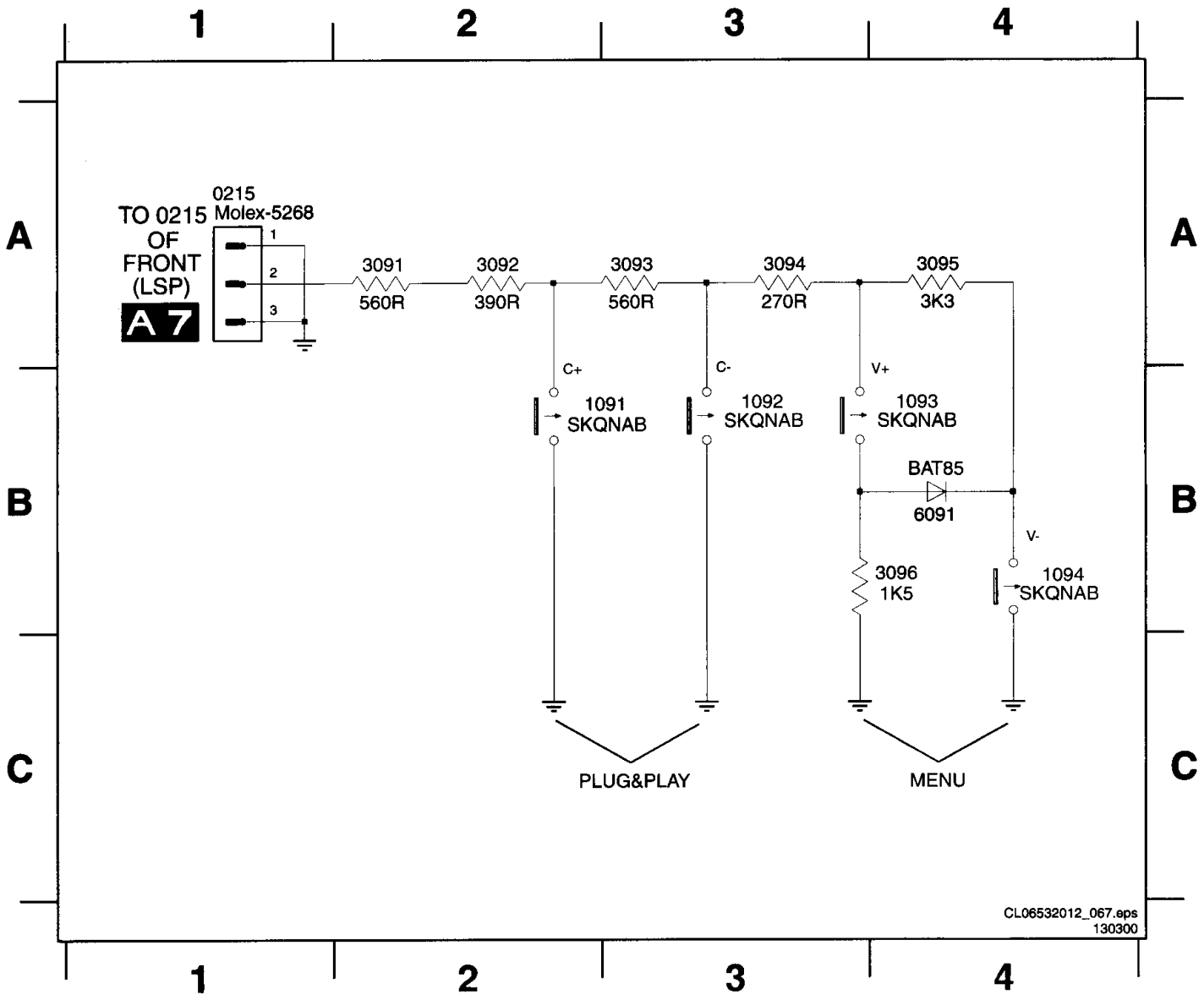
# SIDE IO PANEL

0240 A4
0241 C4
0242 C4
1254 D1
1255-A D1
1255-B C1
1255-C B1
1256-A A1
1256-B A1
2286 A3
2288 A3
2292 B3
2294 C3
2296 E2
2297 E3
3285 A3
3286 A3
3287 A3
3288 A3
3289 B2
3291 B2
3292 B2
3293 C2
3294 C3
3295 D3
3296 E2
3297 E3
4201 A1
4202 A1
6291 E2
6292 E2
6293 E2
6294 E2
SG01 B2
SG02 A2
SG03 C1
SG04 D1
SG05 D1
SG06 E1
SG07 E1
SG08 B1



## Top control

# TOP CONTROL PANEL

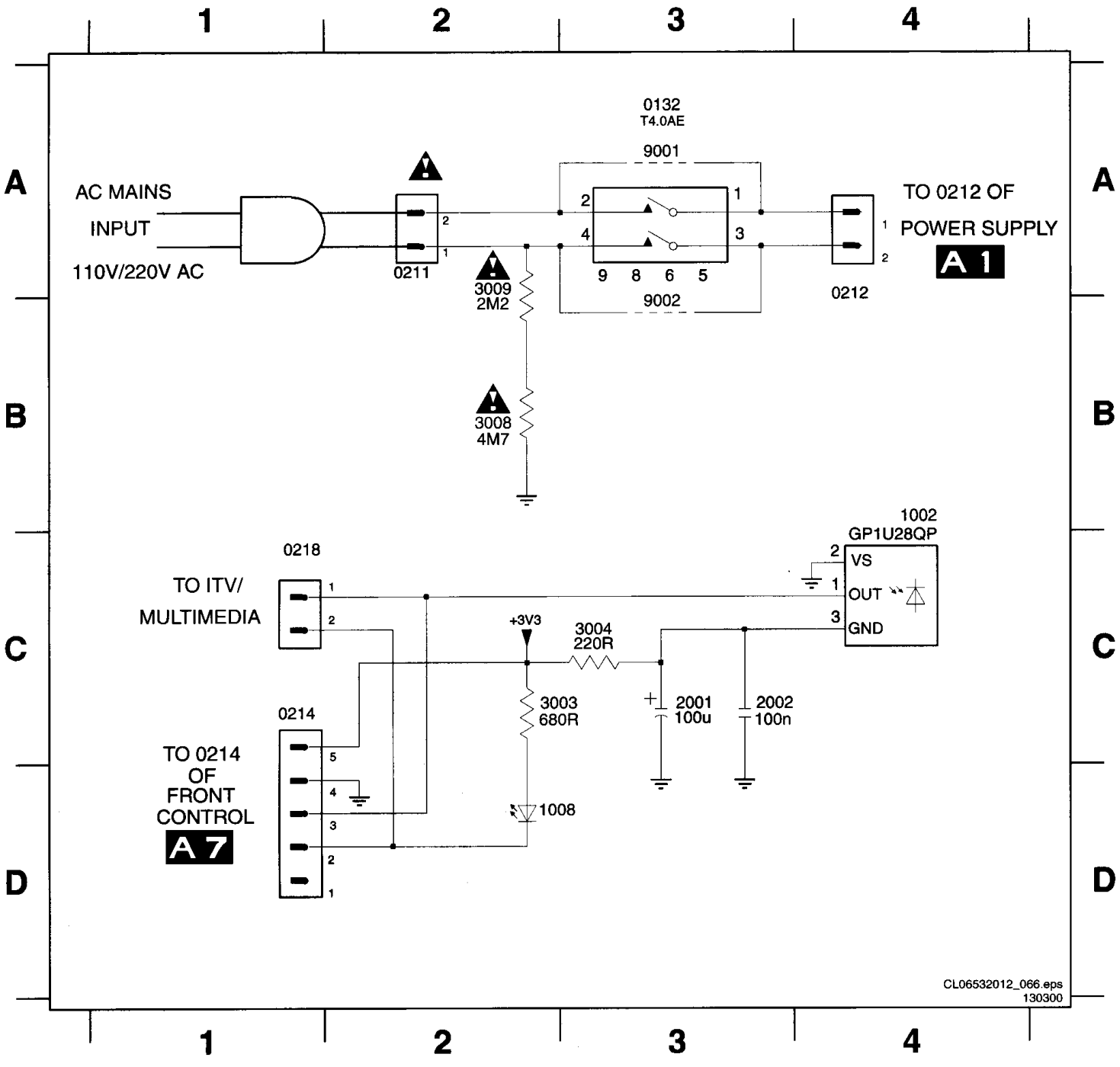



0215 A1
1091 B3
1092 B3
1093 B4
1094 B4
3091 A2
3092 A2
3093 A3
3094 A3
3095 A4
3096 B4
6091 B4

## Front interface

# J FRONT INTERFACE PANEL

| | | | | | |
|---|---|---|---|---|---|
| 0132 A3 | 0214 C1 | 1002 B4 | 2002 C3 | 3003 C2 | 3009 A2 |
| 0211 A2 | 0218 C1 | 1008 D2 | 3001 D2 | 3004 C3 | 9001 A3 |
| 0212 B4 | 1000 D2 | 2001 C3 | 3002 D3 | 3008 B3 | 9002 B3 |



# 8. Alignments

General: The Service Default Mode (SDM) and Service Alignment Mode (SAM) are described in chapter 5.

## 8.1 Alignment conditions

All electrical adjustments should be performed under the following conditions:

- Supply voltage: 220-240V +/- 10%
- Warm-up time: 10 minutes
- The voltages and oscillograms are measured in relation to the tuner earth.
- Test probe: Ri > 10MΩ Ci < 2.5 pF.

## 8.2 Electrical alignments

### 8.2.1 VG2

***Rough alignment***
Using a pattern generator displaying a circle pattern, adjust the VG2 potmeter of LOT L5630 to obtain normal picture.

***Fine adjustment***

1. Activate the SAM-menu. Go to the sub-menu " WHITE TONE" and select the subsubmenu NORMAL.
   - Adjust the value of RED, GREEN and BLUE to 40
   - Adjust the value of RED, GREEN and BLUE to 42 for 29" RF.
2. Temporarely leave the SAM-menu and go to the normal user menu. Select sub-menu CONTRAST and set it to 0.
3. Switch OFF the normal user menu and return to the SAM-menu. Disable black current loop by changing the AKB bit.

Connect RF output of the pattern generator to antenna. Test pattern: blank pattern (blank screen on CRT). Set the time base of the oscilloscope to 0.5ms with external triggering of the vertical pulse. Measure the black level pulse during the vertical flyback at the RGB cathodes of the CRT.

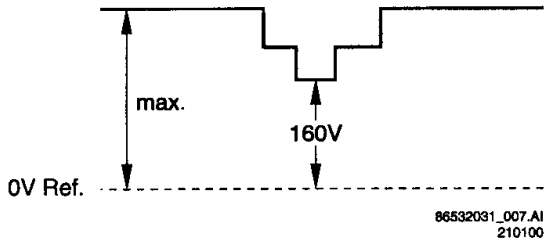



**Figure 8-1 Black level pulse**

Adjust the highest of the three guns with the VG2 pot meter of the LOT to 160Vdc for 24", 25" and
28" BLD WS" set, while the min. black level voltage 165Vdc is for 28" BLSW, 28" RFW, 29" RF and 32" BLSW picture tubes.

### 8.2.2 Focus

Set the "SMART" picture setting to "natural".
Using a pattern generator displaying a crosshatch pattern, adjust the focus potmeter of LOT L5431 in such a way that the haze on the vertical lines at 2/3 from the left and right edges of the screen (just) disappears.

## 8.3 Software alignments (Service Alignment Mode)

With the software alignments of the Service Alignment Mode the geometry, white tone and tuner (IF) can be aligned.

**SAM Menu**

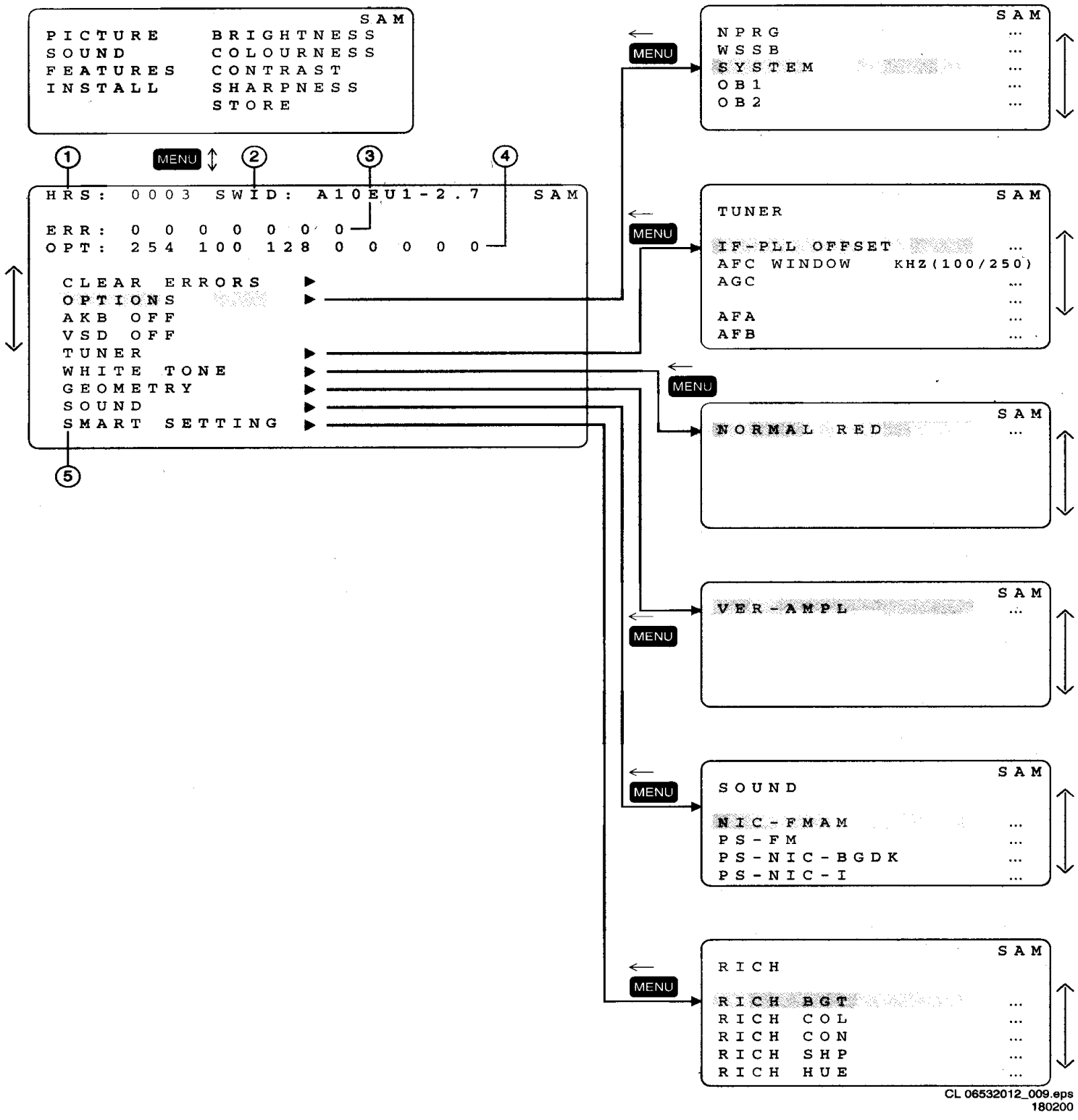



Figure 8-2 Service Alignments Mode screens and structure

### 8.3.1 Tuner

***AGC***

Set pattern generator (e.g. PM5418) with colour bar pattern and connect to aerial input with RF signal amplitude - 10mV and set frequency for PAL/SECAM to 475.25 MHz. For France select the L'-signal.

- Activate the SAM-menu. Go to the sub-menu " TUNER", select the sub-menu option AFC WINDOW and adjust the value to 100kHz.
- Select the AGC sub-menu
- Connect a DC multi-meter to pin 1 of the tuner IC 1225.
- Adjust the AGC until the voltage at pin 1 of the tuner is 1.0V +/- 0.1V.
- The value can be incremented or decremented by pressing the right/left MENU-button on the RC.
- Switch the set to standby.

***Tuner options - IF PLL OFFSET and AFC WINDOW***

NO ADJUSTMENTS NEEDED FOR THESE ALIGNMENTS
The default values for these options are:

- IF PLL OFFSET :
- AFC WINDOW :

### 8.3.2 White tone

In the white tone sub menu the colour values for the colour temperature values can be changed.
The colour temperature mode (NORMAL, DELTA COOL, DELTA WARM) or the colour (R, G, B) can be selected with the RIGHT/LEFT cursor keys. The mode or value can be changed with the UP/DOWN cursor keys.
First the values for the NORMAL colour temperature should be selected. Then the offset values for the DELTA COOL and DELTA WARM mode can be selected. Note that the alignment values are non-linear
0 represent the middle value (no offset difference)
+1 to +63 represent a positive offset (63 is the maximum positive offset)
-63 to -1 represent a negative offset ( -63 is the minimum negative offset)
Negative <<< -63, -62,..., -1, 0, 1,..., 62, 63 >>> Positive (0 = no offset)

### 8.3.3 Geometry

The geometry alignments menu contains 13 items to align a correct picture geometry. In widescreen sets, the GEOMETRY SW is available for separate alignments of the superwide (panorama) mode. The geometry alignments are:
Initial set-up:

- Activate the SAM-menu. Go to the sub-menu "SMART SETTING" and change the setting to NATURAL.
- Exit the sub-menu "SMART SETTING" and go to sub-menu " GEOMETRY".
  - Adjust VER-SCOR to 8 for 28" WS-sets
  - Adjust VER-SCOR to 13 for 25", 28", 29" 32" and 34" picture tubes.
  - Adjust VER-SCOR to 23 for 29" SF- sets
- Vertical zoom is fixed at a default value of 25
- Vertical scroll is fixed at a default value of 32

VER-SCOR; align the vertical linearity, meaning that vertical intervals of a grid-pattern must be equal over the entire height.
Extra Alignment for 4:3 sets and Widescreen sets ( Widescreen mode )

- Set Service blanking on SERV-BLK ON
- Adjust Vertical slopeVER-SLOPE xx
- Set Service blanking OFFSERV-BLKOFF

General Alignment (4:3 set, Widescreen and Superwide mode)

- Adjust Vertical amplitudeVER-AMPL xx
- Adjust Vertical shirtVER-SHIFT xx
- Adjust Horizontal shiftHOR-SHIFT xx
- Adjust Horizontal widthEW-WIDTH xx
- Adjust ParabolaEW-PARA xx
- Adjust Up cornerEW-UCORN xx
- Adjust low cornerEW-LCORN xx
- Adjust TrapeziumEW-TRAP xx
- Adjust Horizontal parrallogramEW-PARA xx
- Adjust Horizontal bowHOR-BOW xx

SERV.BLK: switch on/off the blanking of the lower half of the screen (To be used in combination with the vertical slope alignment)
VER-SLOPE; Align the vertical centre of the picture to the vertical centre of the CRT. (This is the first alignment to be performed of the vertical alignments)
VER-AMPL; align the picture height (other vertical alignments are NOT compensated)
VERSHIFT; align the vertical centre of the picture to the vertical centre of the CRT
HORSHIFT; align the horizontal centre of the picture to the horizontal centre of the CRT
EW-WIDTH; align the picture width (*)
EW PARA; align straight vertical lines at the sides of the screen (*)
EW-UCORN; align straight vertical lines in the upper corners of the screen (*)
EW-LCORN; align straight vertical lines in the lower corners of the screen (*)
EW TRAP; align straight vertical lines in the middle of the screen (*)
EW-PARA; align straight vertical lines in the top and in the bottom; vertical rotation around the centre (*)
HOR-BOW; align straight horizontal lines in the top and the bottom; horizontal rotation around the centre
Alignments indicated with (*) are not applicable for sets without East/West circuitry

### 8.3.4 Sound

NO ADJUSTMENTS NEEDED FOR SOUND
The default values for the audio alignments are:

- NIC-FMAM : 250 NICAM error rate threshold, the higher the more tolerance
- PS-FM: 38 Prescale for FM
- NIC BG/DK: 82 Prescale for NICAM in BG/DK system
- NIC I: 127 Prescale for NICAM in I system
- NIC L: 82 Prescale for NICAM in L system

## 8.4 Options

### 8.4.1 Options

Options are used to control the presence / absence of certain features and hardware. There are two ways to change the option settings, see Figure 2 : Service Alignments Mode screens and structure.

1. Changing a single option
   An option can be selected with the MENU UP/DOWN keys and its setting can be changed with the MENU LEFT/ RIGHT keys
2. Changing multiple options by changing option byte values
   Option bytes make it possible to set very fast all options. An option byte represents a number of different options. All options of the A10 are controlled via 7 option bytes. Select the option byte (OB1, OB2, OB3, OB4, OB5, OB6 or OB7) and key in the new value.
3. Changes in the options and option bytes settings are saved by selecting STORE and pressing the MENU RIGHT key. All changes are disregarded when the OPTION submenu is left without using the STORE command. Some changes will only take affect after the set has been switched OFF and ON with the mains switch (cold start).

### 8.4.2 List of options

Unless otherwise stated Y(es) means present (or ON), N(o) means not present (or OFF).

| Features | Abbreviations (A10) | Description |
|---|---|---|
| Auto Standby with no picture | SBNP | OFF = Disabled, no automatic switch to standby |
| | | ON = Enabled, set switches to standby after 10 minutes when no ident |
| Side AV Source | AV3 | OFF = Disabled, side AV source not avaliable |
| | | ON = Enabled, side AV source avaliable |
| Picture Setting for compress 16:9 | C169 | OFF=Disabled, 16:9 COMPRESS setting is not available in FORMAT menu |
| | | ON = Enabled, 16:9 COMPRESS setting is available in FORMAT menu item |
| | | Note 1: |
| Picture Setting for expand 14:9 | E149 | OFF= Disabled, 14:9 EXPAND setting is not available in FORMAT menu |
| | | ON= Enabled, 14:9 EXPAND setting is available in FORMAT menu item |
| | | Note 2: |
| Wide screen | WSCR | OFF= Disabled, WIDESCREEN is replaced by FORMAT |
| | | ON = Enabled, FORMAT is replaced by WIDESCREEN |
| Hospitality mode | HOSP | OFF = Disabled, hospital mode cannot be entered |
| | | ON = Enabled, hospital mode can be entered |
| Smart clock/Autochron | SMCK | OFF= Disabled, menu item smart clock function not available |
| | | ON = Enabled, menu item smart clock function available |
| | | Note 3: |
| Comb filter | CBFL | OFF= Disabled, no comb filter on the SSB |
| | | ON = Enabled, comb filter on the SSB |
| Incredible picture | IPIX | OFF= Disabled, INCR. PICT is replaced by CONSTRAST+ |
| | | ON = Enabled, CONSTRAST+ is replaced by INCR.PICT |
| | | Note 4: |
| Incredible picture via menu | IPMU | OFF = Disabled, menu item INCR. PICT not available |
| | | ON = Enabled, menu item INCR. PICT available |
| | | Note 5: |
| Dynamic Noise Reduction/Noise Reduction | DNRM | OFF=Disabled, menu item NOISE REDUCTION not available |
| | | ON= Enabled, menu item NOISE REDUCTION available |
| | | Note 6: |
| Virtual dolby | VDBY | OFF = Disabled, menu item DOLBY VIRTUAL not available |
| | | ON = Enabled, menu item DOLBY VIRTUAL available |
| | | Note 7: |
| NTSC playback hardware configuration | NTSC | OFF= Disabled, NTSC playback not possible |
| | | ON = Enabled, NTSC playback possible |
| System (*) | SYSTEM | EW - Select West Europe's colour and sound system |
| | | EE - Select East Europe's colour and sound system |
| | | EM - Select Central Europe's colour and sound system |
| Favorite page | FAPG | OFF = Disabled favourite page in Teletext mode |
| | | ON = Enabled favourite page in Teletext mode |
| Philips tuner | PITN | OFF = Disabled, ALPS compatible tuner is used |
| | | ON = Enabled, Philips compatible tuner is used |
| Automatic Channel Installation | ACI | OFF = Disabled Automatic Channel Installation |
| | | ON = Enabled Automatic Channel Installation |
| | | Note 8: |
| Automatic Volume Leveller | AAVL | OFF=Disabled, menu item AVL not available |
| | | ON= Enabled, menu item AVL available |
| | | Note 9: |
| Automatic Tuning System | ATS | OFF= Disabled, automatic tuning system is ignored. |
| | | ON = Enabled Automatic Tuning System,sort the program in an ascending order starting from Program 1 |
| Program List | PLST | OFF= Disabled, the access to Program List Command is ignored |
| | | ON = Enabled, the access to Program List Command is processed |
| Virgin Mode | VMOD | OFF = Disabled, cannot access virgin mode |
| | | ON = Enabled, can access virgin mode |
| | | Note 10: |

| Features | Abbreviations (A10) | Description |
|---|---|---|
| Smart OSD ( Picture and Sound ) | SOSD | OFF = Disabled, full display of OSD not available |
| | | ON = Enabled, full display of OSD available |
| | | Note 11: |
| UK Plug aNd Play | UKPNP | OFF = Disabled, cannot access Play and Play" |
| | | ON= Enabled, can access Plug and Play" |
| | | Note 12: |
| Rotation tilt | ROTI | OFF = Disabled, menu item ROTATION not available |
| | | ON = Enabled, menu item ROTATION available |
| | | Note 13: |
| SoundBoard MSP3451 | SNIC | OFF = Disabled,Sound IC MSP3451 is not present |
| | | ON = Enabled, Sound IC MSP3451 is present |
| Time Window | TMWIN | OFF = Disabled, Time Window is set to 2 secs. |
| | | ON = Enabled, Time Window is set to 5 secs. |
| Video Mute | VMUT | OFF = Disabled, no video blanking during channel/source change |
| | | ON = Enabled, video blanking during channel/source change |
| Wide Screen Signal Bit | WSSB | OFF = disable the detection of off-air transmission widescreen signal bit |
| | | ON = to enable the detection |
| Dual Page Teletext | DTXT | OFF = disable dual-page teletext |
| | | ON = to enable |
| Auto Picture Control | APC | OFF = disable incredible picture and DNR/NR optimisation (user control) |
| | | ON = enable incredible picture and DNR/NR optimisation (user no control) |
| Electronic Program Guide | EPG | OFF = Disabled, EPG feature is not available |
| | | ON = Enabled, EPG feature is available |
| Easylink communication protocol between TV/VCR | P50 | OFF = Disabled, P50 feature not available |
| | | ON = Enabled, P50 feature is available |
| Internal Comb Filter | INCF | OFF = disable the BOCMA internal combfilter (for demo purpose) |
| | | ON = to enable |
| Max no. of Programs | NPRG | OFF = Disabled, maximum no. of program 100 |
| | | ON = Enabled, maximum no. of program is 80 |

### 8.4.3 Option bits/bytes

Option bytes for West European sets with software naming : A10ET1-x.y. This software version contains only 10 pages of TXT.
OB1 bits 8, 7, ..., 1: SBNP, C169, E149, HOSP, SMCK, AV3, WSCR, CBFL
OB2 bits 8, 7, ..., 1: IPIX, IPMU, NTSC, PITN, ACI, ATS, PLST, VMOD
OB3 bits 8, 7, ..., 1: SOSD, FAPG, UKPNP, DNRM, VMUT, AAVL, ROTI, SNIC
OB4 bits 8, 7, ..., 1: TMWIN, NPRG, WSSB, INCF, (res), (res), (res), (res)
OB5 bits 8, 7, ..., 1: (RESERVED)
OB6 bits 8, 7, ..., 1: (RESERVED)
OB7 bits 8, 7, ..., 1: (RESERVED)
OB8 bits 8, 7, ..., 1: (res), (res), (res), (res), (res), (res), SYSTEM, SYSTEM
Option bytes for West European sets with software naming : A10EP1-x.y. This software version contains 100 pages of TXT.
OB1 bits 8, 7, ..., 1: SBNP, C169, E149, HOSP, SMCK, AV3, WSCR, CBFL
OB2 bits 8, 7, ..., 1: IPIX, IPMU, NTSC, VDBY, EPG, P50, PITN, ACI
OB3 bits 8, 7, ..., 1: ATS, PLST, VMOD, SOSD, FAPG, UKPNP, DTXT, DNRM
OB4 bits 8, 7, ..., 1: VMUT, AAVL, ROTI, SNIC, TMWIN, NPRG, WSSB, INCF
OB5 bits 8, 7, ..., 1: APC, (res), (res), (res), (res), (res), (res), (res)
OB6 bits 8, 7, ..., 1: (RESERVED)
OB7 bits 8, 7, ..., 1: (RESERVED)
OB8 bits 8, 7, ..., 1: (res), (res), (res), (res), (res), (res), SYSTEM, SYSTEM

An option byte value is calculated in the following way:
value “option bit 1” x 1 =
value “option bit 2” x 2 =
value “option bit 3” x 4 =
value “option bit 4” x 8 =
value “option bit 5” x 16 =
value “option bit 6” x 32 =
value “option bit 7” x 64 =
value “option bit 8” x 128 =
Total : value “option byte” =

# 9. Circuit descriptions and abbreviation list

## 9.1 Circuit descriptions

The following circuits are described:

1. Introduction
2. Block diagram
3. Power supply (see A8 TM: 4822 727 21613)
4. Control
5. Tuner & IF
6. Video processing
7. Synchronisation
8. Horizontal deflection (see A8 TM: 4822 727 21613)
9. Vertical deflection (see A8 TM: 4822 727 21613)
10. Audio processing
11. OSD / Teletext / NexTView
12. CRT / SCAVEM / Rotation

### 9.1.1 Introduction

The A10E is the successor of the A8-chassis. A10 is the chassis name, E stands for Europe.
Where the A8 used a lot of different panels, the A10 architecture consist of 1 conventional large signal panel (LSP) and a small signal board (SSB) module, placed into a so called SIMM-connector (Standard Interface, 80 pins):

- The LSP is built up very conventional, with hardly any surface mounted components on the copper side. It incorporates the Power Supply, the Deflection, the Tuner, the I/O and the Audio Amplifier circuits.
- The SSB is a high tech module (2 sides reflow technology, full SMC) with very high component density. Despite this, it is designed in such a way, that repair on component level will be possible. To achieve this extensive diagnostic possibilities are provided via Service Modes and/or ComPair. The SSB incorporates the IF-, Video/Audio-processing, Control and OSD/TXT circuits.

Due to the low amount of cabling etc., expectation is that the FCR will be low.

In this 'circuit description' chapter, sometimes will be referred to the Training Manual of the A8 (4822 727 21613). This is done for the following circuits: the Power supply, the Horizontal (Line) Deflection and the Vertical (Frame) deflection parts. The electrical principle of these circuits is also applicable on the A10.

### 9.1.2 Block diagram

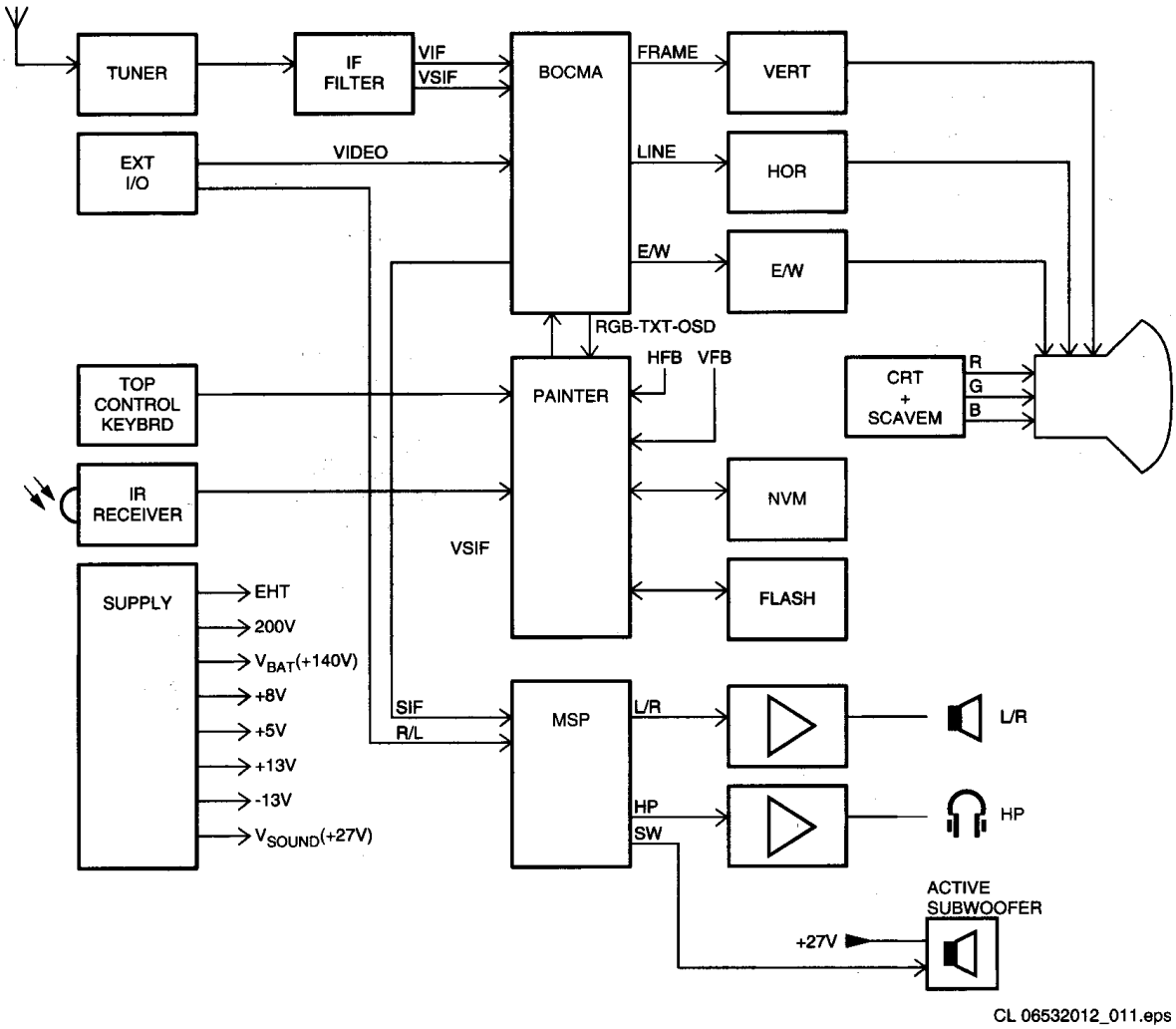



Figure 9-1

The tuner type UV1316 is a PLL tuner and delivers the IF-signal, via audio & video SAW-filters, to the Multi-system TV processor (TDA888x, IC7301 also called BOCMA), which has the following functions:

- Multi-system decoder.
- Video source- and record select.
- Colour decoder.
- RGB output.
- Sound demodulator.
- Geometry control.
- Picture improvement.
- Synchronisation.

The BOCMA has 1 input for the internal CVBS signal and 2 inputs for external CVBS or Y signals. It has only one Chroma input so that it is not possible to apply 2 separate Y/C inputs. The selection is made via the $I^2C$-bus.
It has 2 independently switchable CVBS outputs for e.g. TXT, Comb-filter, CVBS-monitor or PIP (optional).
Two SCART-connectors are used: SCART1 is fully equipped and SCART2 is meant for VCR. Pin 10 of SCART2 is used for Easylink and there is a possibility for Y/C in. The CVBS-out on pin 19 can be used for WYSIWYR (What You See Is What You Record).

Internal video processing is done in the BOCMA with YUV-signals. It also handles the video control, geometry part and the insertion of the TXT/OSD RGB-signals. The video part delivers the RGB signals to the CRT-panel and the geometry part delivers the H-drive, V-drive (differential output), E/W-drive.

Both deflection circuits are located on the LSP and are driven by the BOCMA. The horizontal output stage generates also some supply voltages and the EHT-, focus- and Vg2-voltages.

The RGB amplifiers on the CRT-panel are integrated in one IC (TDA6107Q) and are supplied with 200 V from the LOT. The SCAVEM circuit modulates transitions of the Luminance (Y) signal on the horizontal deflection current, giving a sharper picture.

The sound part is built up around the MSP34xx (Multi-channel Sound Processor) for IF sound detection, sound control and source selection. Dolby decoding is also done by the MSP. Amplification is done via an integrated power amplifier IC, the AN5277.

The microprocessor, called Painter (SAA55XX, IC7064), takes care of the set control, error generation and analogue TXT/ OSD input- and output processing.
The Painter, ROM and RAM are supplied with 3.3 V, which is also present during STANDBY.
The NVM (Non Volatile Memory) is used to store the settings, the flash-RAM contains the set software and the DRAM (located inside the µP) is capable for storing 10 Teletext pages.

The power supply is a Switch Mode Power Supply (SMPS) with minimum voltage switch. It is a flyback converter with primary current sensing, secondary voltage sensing and mains input measuring. It is built around IC7921 (which has a built-in MOSFET and control circuit) and generates a.o. the 140 V (V-BAT) and the 27 V (for the audio part).
During Standby, the power supply is switched to a 'low power burst mode' via TS7946 and the following burst mode generator, in order to reduce the power consumption.
A relay is used to switch the degaussing circuit for several seconds during switching 'ON' of the set.

### 9.1.3 Power supply (diagram A1)

For circuit description see A8 Training Manual: 4822 727 21613.

Differences with the A8 are:

- Item-numbers are different from the one mentioned in the text.
- Degaussing cicrcuit
- Output voltages

***Degaussing circuit (diagram A1: section A1 - D3)***
The degaussing circuit is activated whenever the TV set is turned on. So from normal 'off' to 'on' and from 'stand-by' to 'on' the degaussing circuit is activated. During start-up the signal LIGHT_SENSOR_VDEGAUS (A4-1) is low. After start-up of the µP this becomes high for 2 seconds which forces TS7932 in conduction. Now the coil of the relay is activated and switch 1931 is closed. The mains voltage is now connected to the degaussing coil. The degaussing current passes through the degaussing coil and through PTC 3911 and PTC 3912 which limit the inrush-current.
After these 2 seconds, the signal LIGHT_SENSOR_VDEGAUS goes low, 7900 turns off, the coil of relay 1931 is de-energised and the 220 Vac is disconnected from the degaussing coil. During normal operation, no current passes through the degaussing coil due to the fact that switch 1931 is opened.

***Output voltages***

- +8V_UNREG (Input voltage for stabiliser 7942 and supply voltage for the circuit to activate the degausssing coil) : +13.5 V. If +14 V and +8 V are not present check 1905.
- +33V (For Tuner at Mono-carrier and PIP-panel) : +33 V. Created via R3409 and zenerdiode 6481
- Vbat (Battery Voltage for Line Output Stage) : +140 V
- +8V (BOCMA Supply, Scart, Video at SSB) : +8.3 V. Output voltage from stabiliser 7942. This voltage is decreased in standby to 2.3 V. In standby TS7944 is conducting and switching R3945 parallel to R3942 and R3947.
- +5V_STBY : +5.1 V. This voltage is also present during standby. If this voltage and +5V are missing check Fuse 1961. If the voltage at pin 2 and 5 of IC7968 are present replace 7907.
- +5V (For Tuner, NV_CLOCK, Video at SSB, PIP-panel): +5.1 V. This voltage is disabled when the +13V-VERT is not present at pin 2 of IC7967. +13V -VERT is generated by the line-output circuit. So when the line-output circuit is working correctly the +5V is enabled to start the set.
- +27V (Audio Supply) : +27 V. If this voltage is missing check D6971/6972 and/or sound-amplifier IC7702.
- 3V3_STBY (µP Supply, NVM, BOCMA supply, Receiver LED): This voltage is also present during standby. If this voltage is missing check NFR 3964.

### 9.1.4 Control (diagram C4)

***Micro-processor***
The microprocessor (SAA55XX, IC7064 called Painter) provides:

- Control functions for the TV-set.
- On Screen Display (OSD).
- Teletext functions.
- P50 (Easylink) communication.
- I/O-ports for $I^2C$, RC5, LED, and service modes.
- Error code generation.

For 10 pages TXT-data can be stored internally.
The Non Volatile Memory IC7066 is a 4 kB version M24C32W6.

All ICs in this part are supplied with 3V3 that is also present during Standby. For this voltage a zenerdiode is used (D6966).

For stable OSD and TXT, the display is synchronised to the TV signal processing device by way of horizontal and vertical sync

signals provided by external circuits (HFB and VFB). From these signals all display timings are derived.
The OSD/TXT RGB-outputs (46/47/48) and fastblanking (52) are fed to the BOCMA (pins 35 - 38).

| Pin | Signal | Function |
|---|---|---|
| 1 | TILT | Generates drive signal for rotation circuit |
| 2 | SEL_SVHS_RR_STATUS2 | Selects Y/C source from Side or Rear I/O and detects presence of EXT2 (CVBS) / 4:3 or 16:9 |
| 4 | STATUS1_PIP-AFT_PIP-50-60HZ | Detects presence of EXT1 (CVBS) / 4:3 or 16:9 |
| 5 | KEYBOARD | Input line from Top Control keyboard |
| 6 | FRONT_DETECT | Detects presence of Headphone at FRONT |
| 13 | STAND-BY | To switch between Standby and Normal operation |
| 16 | SEL_MAIN_FRNT_RR | Selects main video source from Rear or Front |
| 17 | COMM_LINE | P50 in/output (Easylink) |
| 18 | LIGHT-SENSOR_VDEGAUSS | Activates the degaussing relay at switch on |
| 24 | SYS1 | Selects Combfilter |
| 25 | SYS2 | Selects Combfilter |
| 28 | ON_OFF_LED | LED driver output |
| 31 | CVBS2OUT | CVBS input for TXT data |
| 32 | G_SC1-IN_Y-IN | |
| 46 | B_TXT_OSD | Blue output for OSD/TXT |
| 47 | G_TXT_OSD | Green output for OSD/TXT |
| 48 | R_TXT_OSD | Red output for OSD/TXT |
| 52 | FBL_TXT_OSD | Fast blanking output for TXT and OSD |
| 52 | FBL_SCAVEM | Fast blanking output for SCAVEM |
| 53 | HFB | H-sync input for stable OSD/TXT |
| 54 | SEL_MAIN_R1R2 | Selects main video source from EXT1 or EXT2 |
| 55 | VFB | V-sync input for stable OSD/TXT |
| 59 | SEL_IF_LL | Switches the appropriate SAW filter for LL' |
| 70 | CLOCK12MHZ | Clock output for external IC's |
| 76 | RC5 | Input line from Remote Control |
| 81 | SCL | Clock output of master I²C bus |
| 82 | SDA | Data in/out of master I²C bus |
| 83 | SCL_2 | Clock output of NVM I²C bus |
| 84 | SDA_2 | Data in/out of NVM I²C bus |
| 93 | AGCuP | |
| 96 | HIS_OFF | To activate the optional Histogram IC TDA9171 |
| 98 | SOUND_ENABLE | Mutes the audio amplifier |
| 100 | PANORAMA | Activates 16:9 feature |

***I²C-busses***
In the A10E-chassis with Painter-processor there are two I²C-busses used:
- Hardware I²C-bus, used for all IC communication.
- Separate short bus for the Non Volatile Memory (NVM), to avoid data corruption.

***NVM***
The Non Volatile Memory IC7066 contains all set related data that must be kept permanently, such as:
- Software identification.
- Operational hours.
- Error-codes.
- Option codes.
- All factory alignments.
- Last Status items for the customer + a complete factory recall.

### 9.1.5 Tuner & IF (diagram A4, C1 & C3)

***Tuner***
The tuner UV1316 is I²C-controlled and is capable of receiving off-air, S- (cable) and Hyperband channels:
- Low 44.25 - 157.25 MHz
- Mid 157.25 - 442.5 MHz
- High 142.5 - 890.0 MHz

Tuning is done via I²C. The reference voltage on pin 9 is 33 V. This voltage is derived from the V-BAT via a resistor of 68 kΩ and a zenerdiode.

***Video IF amplifier***
The IF-filter is integrated in a SAW (Surface Acoustic Wave) filter. One for filtering IF-video (1451 or 1454 in case of system L/L') and one for IF-audio (1455). The type of these filters is depending of the standard(s) that has to be received.

The output of the tuner is controlled via an IF-amplifier with AGC-control. This is a voltage feedback from pin 7 of the BOCMA to pin 1 of the tuner. The AGC-detector operates on top sync and top white level. AGC take-over point is adjusted via the service alignment mode 'Tuner' - 'AGC'. If there is too much noise in the picture, then it could be that the AGC setting is wrong. The AGC-setting could also be mis-aligned if the picture deforms with perfect signal; the IF-amplifier amplifies too much.

An (alignment free) PLL carrier regenerator with an internal VCO demodulates the video signal. This VCO is calibrated by means of a digital control circuit, which uses the clock frequency of the µP as a reference. The frequency setting for the various standards (33.4, 33.9, 38.0, 38.9, 45.75 and 58.75 MHz) is realised via the I²C-bus.
The AFC output is generated by the digital control circuit of the IF-PLL demodulator and can be read via the I²C-bus.

The video identification circuit is used to identify the selected CBVS or Y/C signal.
The IC contains a group delay correction circuit, which can be switched between the BG and a flat group delay response characteristic. This has the advantage that in multi-standard receivers no compromise has to be made for the choice of the SAW filter. Also the sound trap is integrated. The centre frequency of the trap can be switched via the I²C-bus. The signal is available on pin 27.

***QSS sound circuit***
The single reference QSS mixer is realised by a multiplier. In this multiplier the SIF signal is converted to the intercarrier frequency by mixing it with the regenerated picture carrier from the VCO. The mixer output signal is supplied to the output via a high-pass filter for attenuation of the residual video signals. With this system a high performance hi-fi stereo sound processing can be achieved.

The AM sound demodulator is realised by a multiplier. The modulated sound IF signal is multiplied in phase with the limited SIF signal. The demodulator output signal is supplied to the output via a low-pass filter for attenuation of the carrier harmonics. The AM signal is supplied to the output (pin 27) via the volume control.

### 9.1.6 Video processing (diagram C2 & C3)

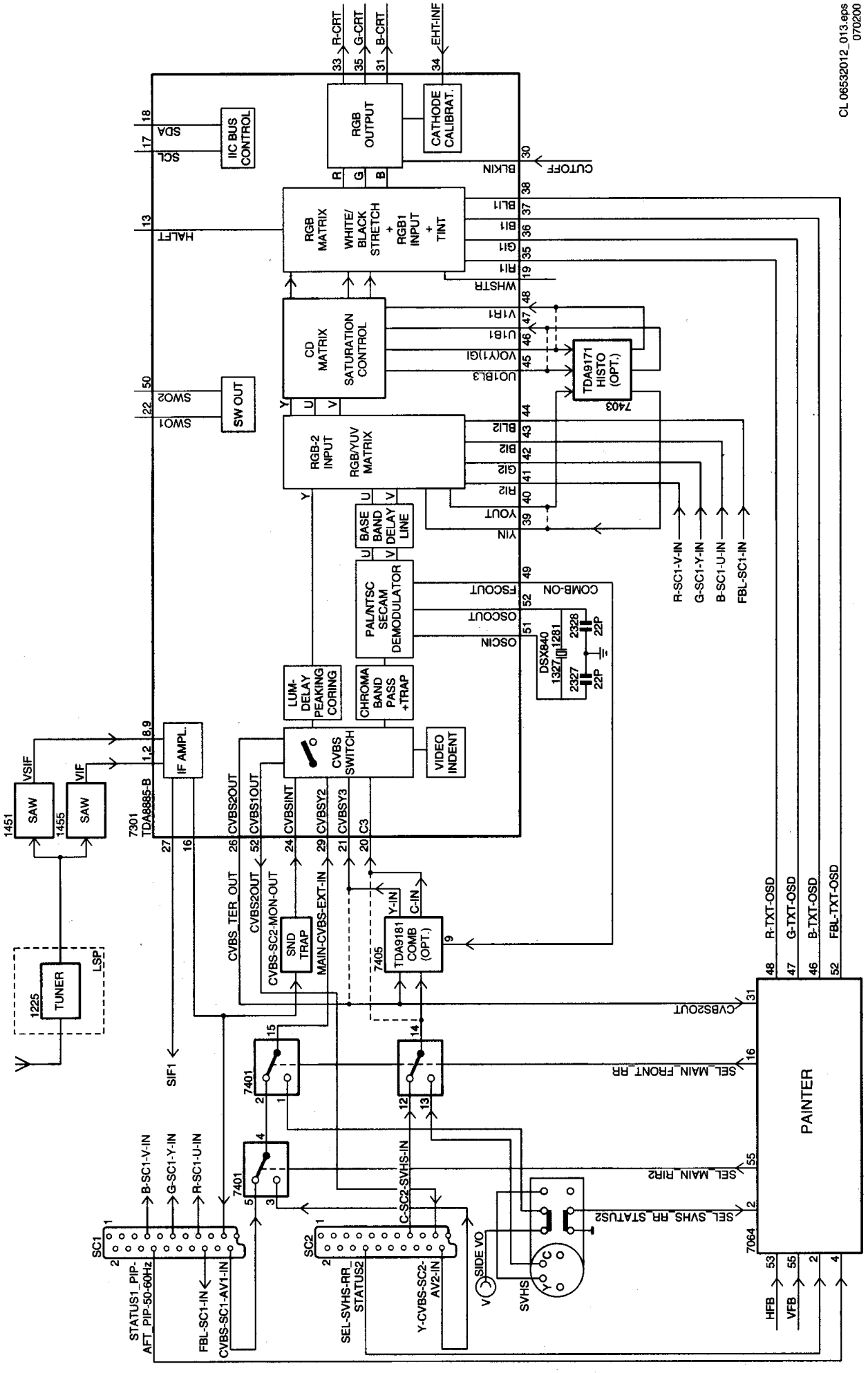



**Figure 9-2**

***Introduction***

The video processing is completely handled by a one-chip video processor the TDA888X. This IC contains:

- IF demodulator.
- Chrominance decoder
- Sync separator.
- Horizontal & vertical drive.
- RGB processing.
- CVBS and SVHS source select.

It has also build in features like:

- CTI.
- Black stretch.
- Blue stretch.
- White stretch.
- Slow start up.
- Dynamic skin tone correction etc.

Further, and this is different with the used TDA884x in the A8, it also incorporates sound IF traps and filters, and requires only one crystal for all systems.

***Source selection***

The BOCMA has an input for the internal CVBS signal and 2 inputs for external CVBS or Y signals. The circuit has only 1 chroma input so that it is not possible to apply 2 separate Y/C inputs.
The selection of the various sources is made via the $I^2C$-bus.
The used IC version has 2 independently switchable outputs:

- The CVBS1 output (pin 54) is identical to the selected signal that is supplied to the internal video processing circuit and is used as source signal for the teletext decoder (Painter). Both CVBS outputs have an amplitude of 2.0 V-PP.
- The CVBS2 output (pin 26) is fed to pin 19 of SCART2 for WYSIWYR (What You See Is What You Record).

If the Y/C-3 signal is selected for one of the outputs, the luminance and chrominance signals are added so that a CVBS signal is obtained again.

The I/O is divided over two parts: Rear I/O and Side I/O. The rear has 2 SCART inputs, the side has only one SVHS input. The I/O signals are routed via the LSP to the SSB panel.

EXT1: The input of SCART1 is CVBS + RGB + L/R and the output is the video (+ sound) signal from the tuner (CVBS_TER_OUT).

EXT2: The input of SCART2 is Y/C + CVBS + L/R. The output signal is CVBS_SC2_MON_OUT (+ sound).
SCART2 is meant for VCR and has therefore some additional signals in relation to EXT1 but no RGB: it has the possibility for Y/C_in and Easylink-Plus (P50): Y_in on pin 20 and Chroma_in on pin 15. Easylink is handled via pin 10 of the SCART2 (this is a bi-directional communication with the µP) and supports the next features:

- Signal quality and aspect ratio matching
- One touch play & text
- PIP
- Pre-set download
- WYSIWYR
- Automatic Standby
- Country and language installation
- System Standby
- Intelligent set top box features
- NexTView download
- Timer record control
- VCR control feature

The selection of the external I/O's is controlled by the µP (pins 16 & 55) and handled via IC7401:

- SEL-MAIN-R1R2 is the selection between SCART1 (R1) and SCART2 (R2).
- SEL-FRNT-RR selection is made between Side and Rear I/O.

The status signals (SCART pin 8) and also Front detection is fed to the Painter (pins 2, 4 and 6).

***Combfilter***

After the selection of the external signals (EXT1, EXT2 or Side I/O) is made, the Y/CVBS signal is fed to the TDA888X (pin 29) along with the Front-end signal (pin 24). The selection between the 2 is made in the BOCMA and the output (pin 26) is fed to the (optional) Comb Filter, whose output is again fed to the BOCMA (pin 21) for further processing. The external colour signals are also fed to the Comb filter. In SVHS mode the Comb filter is bypassed and the external signals are directly fed to the BOCMA.
Switching the Comb filter is done via pen 49 of IC7301. Video standard selection is done via the SYS1 and SYS2 signals from the microprocessor.
If the Combfilter is not used then the jumpers (4472 diagram C3) is present and the external Y/C signals are directly fed to the pins 20, 21 of IC7301.

After this stage we add the external RGB signals (from SCART) to pins 40 - 44.

***Histogram (YUV picture improvement) IC***

The demodulated video-signal can be checked on pins 40, 45 and 46 of IC7301 and is fed to pins 39, 47 and 48. In this path the Histogram IC TDA9171 can be inserted. Without this IC, the jumpers 4436 & 4433 (Y), 4434 & 4432 (U) and 4435 & 4431 (V) are used.
This TDA9178 can control various picture improvements: histogram processing, colour transient improvement and luminance transient improvement.

- Sets without TDA9178; for sets without TDA9178, the Dynamic Skin Tone Control, Blue Stretch and Green Enhancement are controlled by the BOCMA.
- Sets with TDA9178: for sets with TDA9178 the Dynamic Skin Tone Control and Green Enhancement are controlled in the TDA9178. The Blue Stretch is controlled by the BOCMA and the Blue Stretch of the TDA9178 is switched off.

When the TDA9178 is used, noise reduction is also available. The action of the noise reduction has also influence on the sharpness control: if a noisy signal is received then the noise reduction should be high and sharpness low and also vice versa.

***Protections***

Overvoltage conditions (X-ray protection) can be detected via the EHT tracking pin (pin 3). When an overvoltage condition is detected the horizontal output drive signal will be switched-off via the slow stop procedure but it is also possible that the drive is not switched-off and that just a protection indication is given in the $I^2C$-bus.
This pin can also be used to switch off the TV-receiver in a correct way when it is switched off via the mains switch or when the power supply is interrupted by pulling the mains plug. It is possible to place the vertical deflection in an overscan position.

The IC has a second protection input on pin 58 used as 'flash' protection. When this input is activated the horizontal drive signal is switched-off immediately and switched-on again via the slow start procedure.

***Chroma and Luminance processing***

The circuit contains a chroma bandpass and trap circuit (including a luminance delay line and the delay for the peaking circuit). The centre frequency of the chroma bandpass filter is switchable via the $I^2C$-bus so that the performance can be optimised for 'front-end' signals and external CVBS signals.

***Colour decoder***

The colour decoder can decode PAL, NTSC and SECAM signals. The internal clock signals for the various colour standards are generated by means of an internal VCO, which uses the 12 MHz crystal frequency as a reference.
Under bad-signal conditions (e.g. VCR-playback), it may occur that the colour killer is activated although the colour PLL is still in lock. When this killing action is not wanted it is possible to overrule it.
The IC contains an Automatic Colour Limiting (ACL) circuit which is switchable via the $I^2C$-bus and which prevents that oversaturation occurs when signals with a high chroma-to-burst ratio are received.
The reference frequency of the colour decoder is fed to the Fsc output (pin 49) and can be used to tune an external comb filter.
The base-band delay line is integrated. The demodulated colour difference signals are internally supplied to the delay line. The colour difference matrix switches automatically between PAL/SECAM and NTSC.

***Picture improvement features***

In the BOCMA various picture improvement features have been integrated. These features are:

- Video dependent coring in the peaking circuit. The coring can be activated only in the low-light parts of the screen. This effectively reduces noise while having maximum peaking in the bright parts of the picture.
- Colour Transient Improvement (CTI). This circuit improves the rise and fall times of the colour difference signals.
- Black-stretch. This circuit corrects the black level for incoming video signals, which have a deviation between the black level and the blanking, level (back porch).
- Blue-stretch. This circuit is intended to shift colour near 'white' with sufficient contrast values towards more blue to obtain a brighter impression of the picture
- White-stretch. This function adapts the transfer characteristic of the luminance amplifier in a non-linear way dependent on the picture content. The system operates such that maximum stretching is obtained when signals with a low video level are received. For bright pictures the stretching is not active.
- Dynamic skin tone (flesh) control. This function is realised in the YUV domain by detecting the colours near to the skin tone. The correction angle can be controlled via the $I^2C$-bus.

***RGB output***

The IC's have a flexible control circuit for RGB and YUV input signals which has the following features:

- Input which can be used for YUV or RGB input signals and as YUV interface. The selection of the various modes can be realised via the $I^2C$-bus. For the YUV input 2 different input signal conditions can be chosen It is also possible to connect the synchronisation circuit to the incoming Y input signal. This input signal can be controlled on saturation, contrast and brightness.
- The RGB-1 input which is intended for OSD/text signals and which can be controlled on contrast and brightness. By means of software the insertion blanking can be switched on or off. It is also possible to convert the incoming RGB-1 signal to a YUV signal. The resulting signal is supplied to the YUV outputs.
- The TDA888X versions have an additional YUV or RGB input which can be controlled on contrast, saturation and brightness. This signal is supplied to the control circuit via the YUV interface so that an external picture improvement IC will also have effect on this signal.

***Geometry control***

The deflection processor of the TDA888X series offers several control parameters for picture alignment:

- S-correction
- vertical amplitude
- vertical slope
- vertical shift
- vertical zoom
- vertical scroll

for vertical picture alignment, and

- horizontal shift.
- EW width with extended range because of the "zoom" function
- EW parabola width
- EW upper/lower corner parabola
- EW trapezium correction.
- horizontal parallelogram and bow correction

for the horizontal picture alignment.
The IC is designed for use with a DC-coupled vertical deflection stage. This is the reason why a vertical linearity alignment is not necessary (and therefore not available).
All geometry control is done via $I^2C$ and the data is stored in the NVM (IC7066) of the SSB.

***Cut-off control / white drive***

The picture tube is continuously adjusted to prevent visible ageing of the picture tube. In this way the customer has always a perfect picture. This is so-called 'Continuous Cathode Calibration'. The function is realised by means of 2-point black level stabilisation. By inserting two levels for each gun and comparing the result with 2 different reference circuits the drive is controlled. With two different reference currents the influence of picture tube parameters like the spread in cut-off voltage can be eliminated.
The measurement of the 'high' and the 'low' current of the 2-point stabilisation circuit is carried out in 2 consecutive fields. The leakage current is measured in each field, The maximum allowable leakage current is 100 A. The current is measured via Black Current Input (BLKIN) that is fed back to pin 30 of IC7301.
When the TV is switched-on the RGB output signals are blanked and the black current loop will try to set the right picture tube bias levels and then there is RGB-drive.

***Peak White Limiting***

If the beam current becomes too high, the picture tube could be damaged. The control circuit contains a Peak White Limiting circuit (pin 34): if the beam current increases, the EHT-info voltage will decrease. Now the contrast will be reduced. The peak white level is adjustable via the $I^2C$-bus.
The circuit also contains a soft-clipper, which prevents that the high frequency peaks in the output signal become too high. The difference between the PWL level and the soft clipping level is adjustable via the $I^2C$-bus in a few steps.

***Switch-off control***

During switch-off of the TV receiver a fixed beam current is generated by the black current control circuit. This current ensures that the picture tube capacitance is discharged. During the switch-off period the vertical deflection is placed in an overscan position so that the discharge is not visible on the screen.

### 9.1.7 Synchronisation (diagram C1)

***Horizontal synchronisation***

Before the video processor IC7301 can generate horizontal drive pulses, the supply voltages on both pins 23 and 53 must be present. After the start-up command of the µP (via the $I^2C$) the BOCMA starts giving horizontal pulses.
To obtain a smooth switch-on/off behaviour the horizontal drive signal is switched-on/off via the soft-start/soft-stop procedure. This function is realised by means of a variation of the T-ON of the horizontal drive pulse. When the soft-start procedure is completed the horizontal output is gated with the flyback pulse

so that the horizontal output transistor cannot be switched-on during the flyback time.

An additional function of the IC is the 'low-power start-up' feature. For this function a supply voltage with a value between 3 and 5 V must be available at the start-up pin (required current 5 mA typical).
In this condition the horizontal drive signal has the nominal T-OFF and the T-ON grows gradually from zero to the nominal value as indicated in the soft-start behaviour. As soon as the 8 V supply is present, the switch-on procedure (e.g. closing of the second loop) is continued.

The horizontal drive signal is generated by an internal VCO, which is running at a frequency of 25 MHz. This oscillator is stabilised to that frequency by using the 12 MHz frequency of the crystal oscillator as a reference. The horizontal sawtooth oscillator signal is converted into a square wave voltage. This square wave LINEDRIVE1 signal at pin 56 is fed to the line output stage. The time constant of the sync. circuit (different for VCR and weak terrestrial signals) is automatically internally determined by the BOCMA.

On pin 57 of IC7301 the sandcastle pulse (SC) is available. This is a 2-state pulse that is used for the synchronisation of the (optional) IC's 7405 and 7403.

The dynamic phase-correction signal at pin 58 of IC7301 gives horizontal shift corrections during beam current changes. If the beam current increases (more white), the EHT voltage decreases so the picture will become off-centre. This signal takes care that the picture remains in the middle of the screen by adapting the timing of the horizontal drive pulse (LINEDRIVE1).

***Vertical synchronisation***
The vertical sawtooth generator drives the vertical output drive circuit. On pins 63 & 64 are 2 differential voltages FRAMEDRIVE+ and FRAMEDRIVE-. These create differential currents, which are fed to the vertical output stage. Via the $I^2C$-bus adjustments can be made of the horizontal and vertical geometry. t.

***E/W correction***
The EW_DRIVE signal at pin 62 takes care for the correct pin-cushion correction for 110° tubes. It also corrects breathing of the picture due to beam current variations (EHT varies dependent of the beam current: e.g. for widescreen without load this is 31.5 kV and with load (1.5 mA) 29.5 kV). This correction is derived from the signal on pin 34 (EHT_INFO) which "measures" the beam-current. This signal has two functions:
- To correct the pin-cushion due to beam current variations.
- As protection signal. As the beam current is too high (voltage on pin 34 > 3. 5 V) the set is forced into protection.

### 9.1.8 Horizontal (line) deflection (diagram A2)

For circuit description see A8 Training Manual: 4822 727 21613.

Differences with the A8 are:
- Item-numbers are different from the one mentioned in the text.
- Addditional Panorama circuit
- Output voltages: absense of the +30 V for the East-West protection.

### 9.1.9 Vertical (frame) deflection (diagram A3)

For circuit description see A8 Training Manual: 4822 727 21613.

Differences with the A8 are:
- Item-numbers are different from the one mentioned in the text.
- Additional protection circuit "Prot E-W" has been removed.

### 9.1.10 Audio processing (diagram C6 & A6)

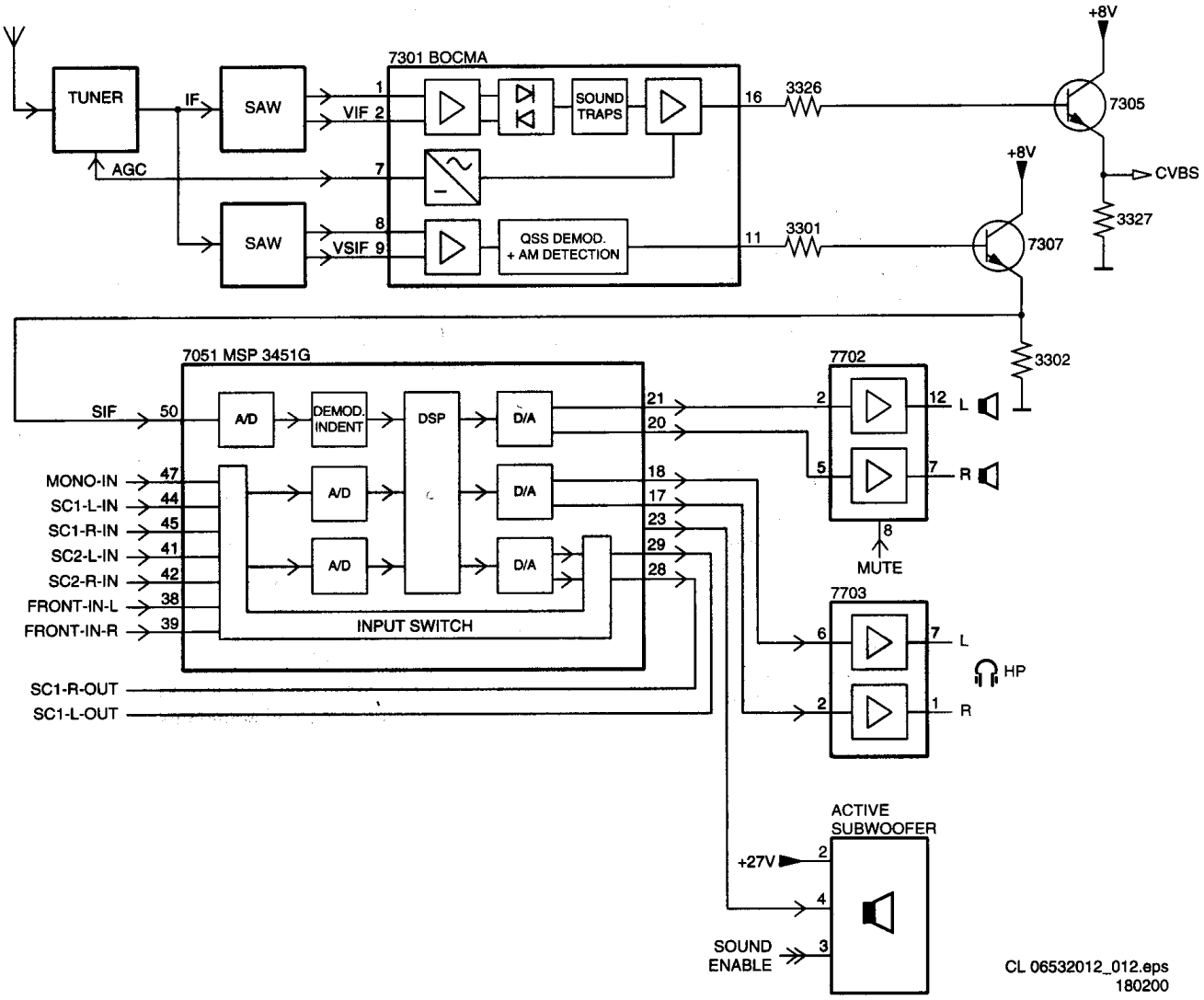



**Figure 9-3**

***Introduction***

The following systems are available:

- Basic : FM/AM mono (all standards).
- NICAM : FM stereo / NICAM B/G, D/K, I, L/L'.
- 2CS : FM stereo / dual language (all standards 4.5, 5.5, 6.5 MHz).

All A10E sets contain one of ITT's Multistandard Sound Processing IC's for sound decoding:

- MSP3415D: Europe & AP decoding, Stereo incl. NICAM.
- MSP3451G: Global decoding, Virtual Dolby.

This IC takes care of the main FM, AM and NICAM sound decoding.
The analogue input and output sections of MSP offer wide range of switching facilities such that it is possible to distribute all possible source signals (internal and external) to the desired output channels (main, headphone or SCART outputs).
All MSP versions contain digital audio processing, used for the basic left/right stereo sound, such as bass, treble, balance, incredible sound and spatial and source selection (SIF-signal, EXT1 or EXT2).
In addition to that, the MSP3451 is also able to perform Virtual Dolby, a Dolby approved sound mode for surround sound reproduction with left/right speakers only.

***Basic***

The MSP is used as sound decoder in all cases of transmission.

***NICAM***

This high quality digital audio format is used in Eastern Europe, Belgium, France, and UK, while NICAM LL' is being used in France.
The IF output from the tuner is filtered by SAW filters. AM sound is directly demodulated from the SIF. The L/L' switching is done for the BOCMA and also on the SAW filter to select the appropriate filter (SEL_IF_LL signal from µP). The SIF from the BOCMA (pin 11) passes through the high pass filter and amplifier into the MSP input (pin 50) for further demodulation.

***2CS***

This analogue FM stereo audio standard is predominately used in Germany and The Netherlands. It is also used on some cable television networks.
The SIF from the BOCMA is available at its CVBS output (pin 11) and passes through the high pass filter and amplifier and fed into the MSP input (pin 50) for further demodulation.
Signals of all standards of 2CS and MONO are demodulated by MSP.

***Source selection***

- MSP3515D (stereo)

This IC is an economised version of the MSP3410 that is used in the MG-chassis. It can cover 2 stereo and 1 mono (AM) input. Since more inputs are required, separate source selectors are used (HEF4052, IC7650 and HEF4053, IC7630). This selector has EXT1, EXT2, FRONT and SC1-OUT (Tuner) as input and is connected to the SCART1 input of the MSP3415. The SCART2 input is not used.

Since the MSP3415 has only one SCART output, which is connected to the SCART1, a constant level output and connection to SCART2 is not available. This is fixed by connecting the HEF4052 input selector to the constant level output and to SCART2.

To get a constant level output if the Tuner is selected, the SCART1 output (Tuner at any time), has to be fed back to the input selector and selected as input for the MSP (SCART1 input).

The MSP3415 has no separate output to drive a headphone. Therefore the speaker outputs are hardwired (on the LSP) to the headphone amplifier.

- MSP3451G (Virtual Dolby)

The MSP3451, which is used in all versions supporting Virtual Dolby, is capable of supporting 4 stereo inputs and 1 mono (AM) input. Therefore the extra input selector (HEF4052) is not needed.

The MSP3451 is also capable of supporting 2 SCART outputs, so the trick used in the MSP3415 set-up to get a constant level output is not needed.

The MSP3451 has a separate headphone output, so sound control be done separate from the speakers.

***Audio decoding***

At the input a choice can be made between two IF-signals; SIF and SIFM.
The selected signal is fed to the AGC. After this, an ADC converts the IF-signal to digital.
This digital signal can be processed by 2 demodulation channels. The first one is able to handle FM and NICAM signals. The second one can handle FM and AM signals.
Each channel contains a mixer to shift the incoming signal in the frequency domain. This shift is determined by the value of a DCO (Digital Controlled Oscillator).
After the down-mix, the signal is fed, via a filter, to a discriminator. From here the AM, FM or NICAM demodulation can be performed.
Both channels contain an 'automatic carrier mute' function, which automatically mutes the output of the analogue section when no carrier is detected.
After demodulation, the FM-signals are subjected to a de-emphasis operation. After that the matrix of the stereo system is applied.

***Audio processing***

The sound processing in A10E is completely done by the MSP3415D for 'Stereo' sets and the MSP3451G for 'Virtual Dolby' sets:

- Volume control is done by the user via the SOUND menu.
- Tone control in 'Stereo' sets is done via the BASS/TREBLE control.
- Headphone control in 'Stereo'-sets is done via the loudspeaker output of the MSP, no sound control possible. In 'Virtual Dolby'-sets, the MSP has a separate Headphone output so separate sound control is possible.
- Mute control can be done in different ways:
  - System muting: via the SOUND_ENABLE line of the Painter. Used during start-up/switch-off conditions, in order to avoid audible plops.
  - Headphone muting: the presence of a headphone is detected by the FRONT_DETECT line. If present the main speakers will be muted.

***Automatic Volume Levelling (AVL)***

One of the features of the MSP-family is AVL. If used, it limits the big volume differences in the broadcast between e.g. news transmissions and commercials or within a movie.
To be able to get a Dolby approval (for the Virtual Dolby sets), the AVL feature must be switchable. Therefore, the AVL feature is customer switchable via the menu.

***Audio amplification (diagram A6)***

The audio output stage is built around IC7702 , which is a balanced amplifier, and is located on the LSP. It uses an monolithic integrated power amplifier IC, the AN5277. The gain of the amplifier is constant. This means that volume control has to be done via the MSP.
The supply voltage is +27 V, generated by the power supply via L5912
The AN5277 delivers an output of 2 x 10 W-RMS to 2 full range speakers. A subwoofer is implemented, for 28" and 32" PW6515 and for 29" FT5515.

***Muting***

There are 3 types of muting available: system mute, headphone status mute and user mute.

- System muting - System muting is implemented for "special events" such as channel/source change event, loss of identification signal, on/off of set, during search and auto store/program, sound mode change. This muting is transparent to the user. Audio output should be muted before the above "special events" occurred, to prevent problems such as audible plop. Muting is done via the SOUND-ENABLE line connected (via TS7701) to pin 8 of the amplifier-IC and coming from the Painter. This signal is inverted by TS7701, as a result of which at a low level of the SOUND-ENABLE signal the IC will mute.
- Headphone status mute - A headphone status is available to detect the presence of the headphone and mute the main speakers if the headphone is detected. The microprocessor will read the FRONT-DETECT status.
- User muting - This is a mute option available to the user. The user select the MUTE option on the remote control to switched off/on the sound output to the main loudspeaker and the subwoofer.

***Headphone amplifier (diagram A6)***

The headphone amplifier is built around IC7703 (TDA1308T), which is an integrated class AB stereo headphone driver.

### 9.1.11 OSD / Teletext / NexTView (diagram C2 & C4)

***OSD***

The On Screen Display information is generated by the microprocessor IC7064. The RGB and blanking signals for the OSD are fed to the RGB/blanking input of the Video Processing section of IC7301 via the same path as the teletext RGB/ blanking signals.

The control circuit of the BOCMA has a half tone input (pin 13) which is used to reduce the contrast setting during mixed mode operation for teletext and OSD signals. The output signal has an amplitude of about 2 V black-to-white at nominal input signals and nominal settings of the controls. To increase the flexibility of the IC it is possible to insert OSD and/or teletext signals directly at the RGB outputs. This insertion mode is controlled via the Fast Blanking insertion input (pin 38).

***Teletext***
Sets with the SAA55XX microprocessor have the capability of decoding and displaying both 525-line and 625-line World System Teletext and offer a 10 page Teletext memory.

The teletext function can be divided into the functions described below:
- The Data Capture section takes in the analogue Composite Video and Blanking Signal (CVBS), and from this extracts the required data, which is then decoded and stored in memory.
- The extraction of the data is performed in the digital domain. The first stage is to convert the analogue CVBS
- signal into a digital form. This is done using an ADC sampling at 12 MHz.
- The data slicer extracts the digital teletext data from the incoming CVBS signal. This is performed by sampling the CVBS signal and processing the samples to extract the teletext data and clock.
- The data and clock recovery is then performed by a Multi-rate Video Input Processor (MulVIP). From the recovered data and clock the following data types are extracted: WST Teletext (625/525), Closed Caption, VPS and WSS. The extracted data is stored in on-chip DRAM via the Memory interface.

The capabilities of the display block are based on level 1.5 teletext. It consists of 25 rows each of 40 characters, with the characters displayed being those from rows 0 to 24 of the page memory. The display block supplies the RGB output signals.

For the display timing the signals VFB and HFB from the LSP are used. The display timing arranges the timing of the RGB signal in order to ensure a stable teletext picture:
- The VFB signal (pin 55) is derived from the vertical deflection circuitry. This is a signal with active 'Low' sync pulses.
- The HFB signal (pin 53) is derived from the horizontal output stage. The HFB signal is a signal with active 'HIGH' sync pulses.

Via the pins 46, 47 and 48 of IC7064 the B, G, R colour signals are supplied respectively to the RGB switch of the TDA888X.The output polarity of all these pins is active 'High'. Via pin 52 of IC7064 the FBL (fast blanking) signal is supplied to the RGB switch. Via the fast blanking signal the R, G, B signals are inserted in the television picture.

***NextView (EPG)***
The EPG in A10 provides the TV viewer with information on the programmes that are being broadcast that day by the first 20 pre-sets. Its functionality is based on the availability of broadcasters transmitting Teletext pages with NexTView data. In regions where no NexTView but still Teletext is broadcasted, the A10 EPG feature provides easy access to common Teletext pages with programme guide.

### 9.1.12 CRT / SCAVEM / Rotation (diagram B / B / A7)

***RGB amplifiers***
The integrated RGB video amplifier (IC7830 located on the CRT-panel) has three amplifier channels inside and drives the three cathodes of the colour CRT. The main features of this IC (TDA6107Q) are :
- This amplifier is connected to 200 V only (13 V reference is generated internally).
- Black current stabilisation output is also generated internally and this signal goes directly to the BiMOS feedback input.
- Thermal protection.

The amplifiers are basically 'negative feedback OpAmps' located inside the IC. Pins 1, 2 and 3 are inverting inputs for Green, Red and Blue; pins 7, 8 and 9 are cathode outputs for Blue, Red and Green. Pin 5 is the black current stabilisation output.

Cut-off stabilisation is an auto-tuning loop (active during a four-line period prior to the end of a field blanking pulse) which stabilises the black current of each RGB-channel sequentially and independently. This is a new concept known as 'Continuous Cathode Calibration', provided by the BiMOS. In this concept the cathode drive is adjusted at two points and hence provides better accuracy of black level.

To protect the RGB-amplifier against picture tube flashover discharge, an external protection circuit consisting of D6831, D6833 and D6835 combined with 100 Ohm resistors R3831, R3833 and R3835 is implemented. These diodes clamp the cathode output voltage to VDD. To limit the diode current, external resistors R3832, R3834 and R3836 of 1 kOhm are connected in series with the cathode input of each gun, in conjunction with the 2 kV sparkgaps in the CRT socket.

***SCAVEM***
The SCAVEM-circuitry is implemented in the layout of the picture tube panel. It is thus not an extra module. SCAVEM means SCAn VElocity Modulation. This means that the horizontal deflection is influenced by the picture content. In an ideal square wave, the sides are limited in slope by a limited bandwidth (5 MHz).
SCAVEM will improve the slope as follows: At a positive slope, a SCAVEM-current is generated which supports the deflection current. The first half of the slope the spot is accelerated and the picture is darker, while at the second half of the slope, the spot is delayed and the slope becomes steeper.
At the end of the slope, the SCAVEM-current decays to zero and the spot is at the original position. An overshoot occurs which improves the impression of sharpness. At the negative slope, the SCAVEM-current counteracts the deflection.
During the first half of the slope, the spot is delayed, the slope becomes steeper.
During the second half the spot accelerates, the SCAVEM-current is zero at the end of the slope.

Via connector 0238, signal 'Y_MAIN_IN' is added to the emitter of TS7864. Via the emitter follower formed with TS7860, this signal is conveyed to the differentiator C2878 and R3864. Only the high frequencies are differentiated (small RC-time). The positive and negative pulses of this signal drive respectively TS7861 and TS7865 into conductivity. The DC setting of the output stage is set by R3870, R3871, R3872 and R3873. The working voltage of the transistors is settled at half the supply voltage.
At the positive section of the pulse, the current flows through R3887 and C2869, the SCAVEM-coil and TS7863. At the negative section of the pulse, the current flows through R3886 and C2869, the SCAVEM-coil and TS7862.

***Rotation***
In sets with a rotation coil (widescreen sets ≥ 32"), the amount of frame rotation is adjusted with the TILT-output of the Painter (pin 1).

## 9.2 Abbreviation list

| | |
|---|---|
| 2CS | 2 Carrier Stereo |
| ACI | Automatic Channel Installation: algorithm that installs TV sets directly from cable network by means of a predefined TXT page |
| ADC | Analogue Digital Converter |
| AFC | Automatic Frequency Control: control signal used to tune to the correct frequency |
| AGC | Automatic Gain Control: algorithm that controls the video input of the featurebox |
| AM | Amplitude Modulation |
| AR | Aspect Ratio: 4 by 3 or 16 by 9 |
| Artistic | see Painter 2.5: main processor |
| AVL | Automatic Volume Level |
| BG | System B and G |
| BLKIN | Black current information |
| B-SC1-IN | Blue SCART1 in |
| B-SC2-IN | Blue SCART2 in |
| B-TXT | Blue teletext |
| BOCMA | Bimos one Chip Mid-end Architecture |
| C-FRONT | Chrominance front input |
| CL | Constant Level: audio output to connect with an external amplifier |
| ComPair | Computer aided rePair |
| CRT | Cathode Ray Tube or picture tube |
| CSM | Customer Service Mode |
| CTI | Colour Transient Improvement: manipulates steepness of chroma transients |
| CVBS | Composite Video Blanking and Synchronisation |
| CVBS-EXT | CVBS signal from external source (VCR, VCD, etc.) |
| CVBS-INT | CVBS signal from Tuner |
| CVBS-MON | CVBS monitor signal |
| CVBS-TER-OUT | CVBS terrestrial out |
| DFU | Direction For Use: description for the end user |
| DNR | Digital Noise Reduction: noise reduction feature of the box |
| DSP | Digital Signal Processing |
| DST | Dealer Service Tool: special remote control designed for dealers to enter e.g. service mode |
| DVD | Digital Versatile Disc |
| DYN-PHASE-CORR | Dynamic phase correction |
| EHT | Extra High Tension |
| EHT-INFO | Extra High Tension information |
| EPG | Electronic Program Guide: system used by broadcasters to transmit TV guide information (= NexTView) |
| EW | East West, related to horizontal deflection of the set |
| EXT | External (source), entering the set via SCART or via cinches |
| FBL | Fast Blanking: DC signal accompanying RGB signals |
| FBL-SC1-IN | Fast blanking signal for SCART1 in |
| FBL-SC2-IN | Fast blanking signal for SCART2 in |
| FBL-TXT | Fast Blanking Teletext |
| FIL | Filament supply voltage |
| FM | Field Memory or Frequency Modulation |
| FRONT-C | Front input chrominance (SVHS) |
| FRONT-DETECT | Front input detection |
| FRONT-Y_CVBS | Front input luminance or CVBS (SVHS) |
| G-SC1-IN | Green SCART1 in |
| G-SC2-IN | Green SCART2 in |
| G-TXT | Green teletext |
| HA | Horizontal Acquisition: horizontal sync pulse coming out of the BOCMA |
| HFB | Horizontal Flyback Pulse: horizontal sync pulse from large signal deflection |
| BOCMA | High-end video Input Processor: video and chroma decoder of A10E |
| HP | Headphone |
| Interlaced | Scan mode where two fields are used to form one frame. Each field contains half the number of the total amount of lines. The fields are written in "pairs", causing line flicker. |
| IO-BUS | In/Out - Bus |
| Last Status | The settings last chosen by the customer and read and stored in RAM or in the NVM. They are called at start-up of the set to configure it according the customers wishes |
| LED | Light Emitting Diode |
| LINE-DRIVE | Line drive signal |
| LSP | Large signal panel |
| MSP | Multistandard Sound Processor: ITT sound decoder of A10E |
| MUTE | Mute-Line |
| NC | Not Connected |
| NICAM | Near Instantaneously Companded Audio Multiplexing |
| NVM | Non Volatile Memory: IC containing TV related data e.g. alignments |
| O/C | Open Circuit |
| ON/OFF LED | On/Off control signal for the LED |
| OSD | On Screen Display |
| Painter | On Screen Display, Teletext and Control; also named Artistic (SAA5565) |
| P50 | Project 50 communication: protocol between TV and peripherals |
| PCB | Printed Circuit board |
| PTP | Picture Tube Panel |
| RAM | Random Access Memory |
| RC | Remote Control |
| RC5 | RC5 signal from the remote control receiver |
| RESET | Reset signal |
| ROM | Read Only Memory |
| SAM | Service Alignment Mode |
| SC | Sandcastle: pulse derived from sync signals |
| SCAVEM | Scan Velocity Modulation |
| S/C | Short Circuit |
| SC1-OUT | SCART output of the MSP audio IC |
| SC2-B-IN | SCART2 Blue in |
| SC2-C-IN | SCART2 chrominance in |
| SC2-OUT | SCART output of the MSP audio IC |
| SIF | Sound Intermediate Frequency |
| SIMM | 80-fold connector between LSP and SSB |
| SNDL-SC1-IN | Sound left SCART1 in |
| SNDL-SC1-OUT | Sound left SCART1 out |
| SNDL-SC2-IN | Sound left SCART2 in |
| SNDL-SC2-OUT | Sound left SCART2 out |
| SNDR-SC1-IN | Sound right SCART1 in |
| SNDR-SC1-OUT | Sound right SCART1 out |
| SNDR-SC2-IN | Sound right SCART2 out |
| SNDR-SC2-OUT | Sound right SCART2 out |
| SNDS-VL-OUT | Surround sound left variable level out |
| SNDS-VR-OUT | Surround sound right variable level out |
| SNERT | Synchronous No parity Eight bit Reception and Transmit |
| SSB | Small Signal Board |
| STBY | Standby |

# Circuit descriptions and abbreviation list

| | |
|---|---|
| SW | Subwoofer |
| TXT | Teletext |
| µP | microprocessor |
| V-BAT | main supply for deflection (mostly 141 V) |
| VFB | Vertical Flyback Pulse: vertical sync pulse coming from the feature box |
| VL | Variable Level out: processed audio output towards external amplifier |
| WYSIWYR | What You See Is What You Record: record selection that follows main picture and sound |
| XTAL | Quartz crystal |

# 10. Spare parts list

## LSP [A]

### Various

| | | |
|---|---|---|
| | 3122 785 90160 | Power supply kit A10E |
| | 3122 785 90170 | Line deflection kit A10E |
| 0127▲ | 3122 358 72141 | FUSE HOLDER |
| 0132▲ | 4822 276 14024 | Mains switch |
| 0139 | 4822 492 70788 | IC fixation |
| 0141 | 4822 492 70788 | IC fixation |
| 0188 | 3122 224 04242 | HEATSINK BRACKET |
| 0189 | 3139 124 33361 | SSB BRACKET |
| 0211▲ | 4822 267 10774 | Conn 2P |
| 0212▲ | 4822 265 20723 | Conn 3P |
| 0212▲ | 4822 267 10775 | Conn 2P |
| 0214 | 4822 267 10734 | Conn 5P |
| 0215 | 4822 267 10735 | Conn 3P |
| 0226 | 2422 025 16599 | Conn SIMM 80P |
| 0229 | 4822 267 10748 | Conn 3P |
| 0232 | 4822 267 10565 | Conn 4P |
| 0234 | 4822 267 10735 | Conn 3P |
| 0240 | 2422 025 12485 | Conn 11P |
| 0246 | 4822 267 10565 | Conn 4P |
| 0247 | 4822 267 10734 | Conn 5P |
| 0253 | 4822 267 10735 | Conn 5P |
| 0254 | 4822 267 10735 | Conn 3P |
| 1009 | 9322 127 54667 | RC5 rec. TSOP1836UH1 |
| 1225 | 4822 210 10848 | Tuner UV1316/A |
| 1225▲ | 4822 210 10853 | Tuner TEDE9-004A |
| 1260 | 2422 025 16745 | Conn 42P |
| 1269 | 4822 267 10982 | Conn 2P |
| 1900▲ | 2422 086 10905 | FUSE 4A |
| 1931 | 4822 280 10367 | Conn 1P |
| 1941▲ | 4822 071 51602 | Fuse 1.6A |
| 1961▲ | 4822 071 51602 | Fuse 1.6A |

### ⊣⊢

| | | |
|---|---|---|
| 2009 | 4822 124 40207 | 100µF 20% 25V |
| 2020 | 4822 122 33177 | 10nF 20% 50V |
| 2021 | 4822 122 33172 | 390pF 5% 50V |
| 2023 | 4822 126 14043 | 1µF 20% 16V |
| 2024 | 4822 126 14043 | 1µF 20% 16V |
| 2201 | 5322 122 31863 | 330pF 5% 63V |
| 2202 | 4822 126 13692 | 47pF 1% 63V |
| 2203 | 5322 122 31863 | 330pF 5% 63V |
| 2206 | 5322 122 31863 | 330pF 5% 63V |
| 2208 | 5322 122 31863 | 330pF 5% 63V |
| 2211 | 5322 122 32658 | 22pF 5% 50V |
| 2214 | 5322 122 31863 | 330pF 5% 63V |
| 2215 | 5322 122 31863 | 330pF 5% 63V |
| 2217 | 5322 122 32658 | 22pF 5% 50V |
| 2218 | 5322 122 32658 | 22pF 5% 50V |
| 2222 | 5322 122 32658 | 22pF 5% 50V |
| 2225 | 5322 122 32658 | 22pF 5% 50V |
| 2227 | 4822 122 33575 | 220pF 5% 63V |
| 2231 | 5322 122 31863 | 330pF 5% 63V |
| 2233 | 5322 122 31863 | 330pF 5% 63V |
| 2236 | 5322 122 31863 | 330pF 5% 63V |
| 2238 | 5322 122 31863 | 330pF 5% 63V |
| 2242 | 5322 122 31863 | 330pF 5% 63V |
| 2244 | 5322 122 31863 | 330pF 5% 63V |
| 2246 | 4822 124 81286 | 47µF 20% 16V |
| 2247 | 5322 122 32658 | 22pF 5% 50V |
| 2249 | 4822 122 33575 | 220pF 5% 63V |
| 2251 | 5322 122 31863 | 330pF 5% 63V |
| 2253 | 5322 122 31863 | 330pF 5% 63V |
| 2261 | 4822 124 40196 | 220µF 20% 16V |
| 2262 | 5322 122 31647 | 1nF 10% 63V |
| 2265 | 4822 124 41643 | 100µF 20% 16V |
| 2265 | 4822 124 81044 | 470µF 20% 6.3V |
| 2266 | 2238 580 15645 | 47nF 10% 50V |
| 2271 | 4822 124 21913 | 1µF 20% 63V |
| 2276 | 5322 126 10511 | 1nF 5% 50V |
| 2280 | 5322 122 32531 | 100pF 5% 50V |
| 2281 | 4822 126 13486 | 15pF 2% 63V |
| 2282 | 2238 580 15645 | 47nF 10% 50V |
| 2284 | 4822 124 40207 | 100µF 20% 25V |
| 2404▲ | 4822 122 31177 | 470pF 10% 500V |
| 2406 | 4822 121 43526 | 47nF 5% 250V |
| 2409 | 5322 121 42386 | 100nF 5% 63V |
| 2411▲ | 2020 558 90491 | 1n8 10% 2KV |
| 2411▲ | 4822 126 13435 | 1.2nF 10% 2KV |
| 2411▲ | 4822 126 13862 | 1.5nF 10% 2KV |
| 2411▲ | 4822 126 14053 | 1nF 10% 2KV |
| 2414▲ | 4822 121 70618 | 12nF 5% 1600V |
| 2416▲ | 2020 558 90491 | 1n8 10% 2KV |
| 2416▲ | 4822 126 11503 | 820pF 10% 2KV |
| 2416▲ | 4822 126 13435 | 1.2nF 10% 2KV |
| 2416▲ | 4822 126 13451 | 2.2nF 10% 2KV |
| 2416▲ | 4822 126 13862 | 1.5nF 10% 2KV |
| 2416▲ | 4822 126 14053 | 1nF 10% 2KV |
| 2417▲ | 4822 122 31177 | 470pF 10% 500V |
| 2419 | 2222 479 90022 | 0.43µF 250V |
| 2419 | 2222 479 90029 | 820nF 5% 250V |
| 2419 | 4822 121 43888 | 360nF 5% 250V |
| 2419 | 4822 126 14096 | 560nF 5% 250V |
| 2419 | 4822 126 14097 | 680nF 5% 250V |
| 2420 | 4822 124 12265 | 4.7µF 20% 250V |
| 2420 | 4822 124 41741 | 2.2µF 20% 350V |
| 2422 | 4822 126 13751 | 47nF 10% 63V |
| 2430 | 4822 121 41857 | 10nF 5% 250V |
| 2430 | 4822 121 51305 | 15nF 10% 50V |
| 2430 | 4822 121 70676 | 27P 10% 50V |
| 2434 | 2020 021 91543 | 47µF 20% 160V |
| 2437 | 4822 121 10619 | 220nF 10% 250V |
| 2437 | 4822 121 40472 | 150nF 10% 250V |
| 2437 | 4822 121 40518 | 100nF 10% 250V |
| 2439 | 4822 121 51252 | 470nF 5% 63V |
| 2442 | 4822 126 13838 | 100nF 50V 20% |
| 2445 | 2020 012 93596 | 22µF 20% 250V |
| 2447 | 4822 124 80791 | 470µF 20% 16V |
| 2449 | 4822 124 11767 | 470µF 20% 25V |
| 2449 | 4822 124 80791 | 470µF 20% 16V |
| 2450 | 4822 124 80791 | 470µF 20% 16V |
| 2461 | 5322 121 42386 | 100nF 5% 63V |
| 2463 | 5322 121 42386 | 100nF 5% 63V |
| 2468 | 5322 121 40323 | 100nF 10% 100V |
| 2471 | 4822 121 42035 | 4.7µF 10% 100V |
| 2473▲ | 4822 122 31177 | 470pF 10% 500V |
| 2474 | 2222 347 90232 | 27nF 10% 400V |
| 2474▲ | 4822 121 70545 | 7.5nF 5% 1.6KV |
| 2474▲ | 4822 121 70649 | 9.1nF 5% 1.6KV |
| 2475 | 4822 121 43526 | 47nF 5% 250V |
| 2477 | 2222 479 90022 | 0.43µF 250V |
| 2477 | 4822 121 10781 | 470nF 5% 250V |
| 2478 | 5322 121 10472 | 47µF /25 |
| 2479 | 4822 124 81043 | 10µF 20% 100V |
| 2484 | 4822 121 43526 | 47nF 5% 250V |
| 2485▲ | 4822 126 10206 | 2.2nF 10% 500V |
| 2487▲ | 4822 121 70545 | 7.5nF 5% 1.6KV |
| 2487▲ | 4822 121 70649 | 9.1nF 5% 1.6KV |
| 2488 | 5322 126 10511 | 1nF 5% 50V |
| 2501 | 5322 122 32268 | 470pF 10% 50V |
| 2503 | 5322 122 32268 | 470pF 10% 50V |
| 2505 | 5322 121 42386 | 100nF 5% 63V |
| 2506 | 4822 124 40255 | 100µF 20% 63V |
| 2521 | 4822 121 42408 | 220nF 5% 63V |
| 2522 | 4822 124 40207 | 100µF 20% 25V |
| 2523 | 5322 121 42386 | 100nF 5% 63V |
| 2524 | 5322 121 42386 | 100nF 5% 63V |
| 2531 | 4822 124 40784 | 3300µF 20% 16V |
| 2532 | 4822 124 81286 | 47µF 20% 16V |
| 2701 | 4822 124 22652 | 2.2µF 20% 50V |
| 2702 | 4822 124 40255 | 100µF 20% 63V |
| 2703 | 4822 124 22652 | 2.2µF 20% 50V |
| 2704 | 4822 124 12056 | 1000µF 20% 35V |
| 2705 | 4822 124 21913 | 1µF 20% 63V |
| 2706 | 4822 126 13838 | 100nF 20% 50V |
| 2707 | 4822 123 14026 | 470µF 20% 35V |
| 2708 | 4822 124 21913 | 1µF 20% 63V |
| 2709 | 4822 124 12056 | 1000µF 20% 35V |
| 2711 | 4822 126 13482 | 470nF 20% 16V |
| 2712 | 4822 124 40255 | 100µF 20% 63V |
| 2713 | 4822 126 13838 | 100nF 20% 50V |
| 2714 | 5322 122 32531 | 100pF 5% 50V |
| 2714 | 5322 126 10511 | 1nF 5% 50V |
| 2715 | 4822 124 40255 | 100µF 20% 63V |
| 2716 | 4822 126 13482 | 470nF 20% 16V |
| 2717 | 5322 122 32531 | 100pF 5% 50V |
| 2717 | 5322 126 10511 | 1nF 5% 50V |
| 2718 | 4822 124 40255 | 100µF 20% 63V |
| 2719 | 5322 122 31647 | 1nF 10% 63V |
| 2720 | 5322 122 31647 | 1nF 10% 63V |
| 2722 | 4822 122 33127 | 2.2nF 10% 63V |
| 2723 | 4822 122 33127 | 2.2nF 10% 63V |
| 2726 | 4822 124 40255 | 100µF 20% 63V |
| 2727 | 5322 122 32654 | 22nF 10% 63V |
| 2728 | 5322 122 32654 | 22nF 10% 63V |
| 2729 | 5322 122 32654 | 22nF 10% 63V |
| 2730 | 5322 122 32654 | 22nF 10% 63V |
| 2731 | 4822 126 14043 | 1µF 20% 16V |
| 2732 | 4822 126 14043 | 1µF 20% 16V |
| 2733 | 4822 124 11947 | 10µF 20% 16V |
| 2902 | 4822 126 13589 | 470nF 275V |
| 2905 | 4822 121 70141 | 33nF 5% 400V |
| 2908 | 4822 126 14153 | 2.2nF 10% 1KV |
| 2909 | 4822 126 14153 | 2.2nF 10% 1KV |
| 2915 | 4822 124 12415 | 220µF 20% 400V |
| 2919 | 2020 021 90654 | 47µF 20% 50V |
| 2919 | 4822 124 80604 | 47µF 20% 50V |
| 2921 | 5322 122 32311 | 470pF 10% 100V |
| 2922 | 4822 126 13862 | 1.5nF 10% 2KV |
| 2925 | 5322 122 32311 | 470pF 10% 100V |
| 2927 | 3198 014 01520 | 1N5 10% 50V |
| 2929 | 4822 126 14049 | 1.5nF 20% 250V |
| 2932 | 5322 122 32654 | 22nF 10% 63V |
| 2936 | 4822 126 13337 | 220pF 10% 1KV |
| 2938 | 4822 122 50116 | 470pF 10% 1KV |
| 2940 | 2020 021 91543 | 47µF 20% 160V |
| 2941 | 4822 122 31175 | 1nF 10% 500V |
| 2942 | 4822 121 42408 | 220nF 5% 63V |
| 2943 | 4822 124 40784 | 3300µF 20% 16V |
| 2944 | 4822 124 40433 | 47µF 20% 25V |
| 2945 | 4822 124 81144 | 1000µF 16V |
| 2952 | 4822 126 14585 | 100nF 10% 50V |
| 2953 | 4822 126 13751 | 47nF 10% 63V |
| 2955 | 4822 122 33336 | 8.2nF 10% 50V |
| 2961 | 4822 122 31175 | 1nF 10% 500V |
| 2962 | 4822 124 80061 | 1000µF 20% 25V |
| 2963 | 4822 126 13561 | 220nF 10% 16V |
| 2964 | 4822 122 31175 | 1nF 10% 500V |
| 2966 | 4822 124 41584 | 100µF 20% 10V |
| 2967 | 4822 124 41584 | 100µF 20% 10V |
| 2970 | 5322 122 32331 | 1nF 10% 100V |
| 2974 | 4822 124 11583 | 2200µF 20% 35V |
| 2974 | 4822 124 12056 | 1000µF 20% 35V |

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|---|---|---|
| 3007 | 4822 117 13577 | 330Ω 1% 0.1W |
| 3008 | 4822 051 10102 | 1k 2% 0.25W |
| 3024 | 4822 051 10102 | 1k 2% 0.25W |
| 3025 | 4822 051 20391 | 390Ω 5% 0.1W |
| 3026 | 4822 117 11449 | 2k2 1% 0.1W |
| 3027 | 4822 051 20391 | 390Ω 5% 0.1W |
| 3028 | 4822 051 20562 | 5k6 5% 0.1W |
| 3029 | 4822 051 20472 | 4k7 5% 0.1W |
| 3030 | 4822 051 20122 | 1k2 5% 0.1W |
| 3031 | 4822 116 83933 | 15k 1% 0.1W |
| 3032 | 4822 051 20472 | 4k7 5% 0.1W |
| 3033 | 4822 116 83933 | 15k 1% 0.1W |
| 3034 | 4822 051 10102 | 1k 2% 0.25W |
| 3035▲ | 4822 052 10229 | 22Ω 5% 0.33W |
| 3037 | 4822 051 20182 | 1k8 5% 0.1W |
| 3038 | 4822 051 20182 | 1k8 5% 0.1W |
| 3201 | 4822 116 83868 | 150Ω 5% 0.5W |
| 3202 | 4822 117 13579 | 220k 1% 0.1W |
| 3203 | 4822 116 83868 | 150Ω 5% 0.5W |
| 3204 | 4822 117 10834 | 47k 1% 0.1W |
| 3206 | 4822 116 83868 | 150Ω 5% 0.5W |
| 3207 | 4822 117 13579 | 220k 1% 0.1W |
| 3208 | 4822 116 83868 | 150Ω 5% 0.5W |
| 3209 | 4822 117 10834 | 47k 1% 0.1W |
| 3211 | 4822 116 52201 | 75Ω 5% 0.5W |
| 3212 | 4822 116 52175 | 100Ω 5% 0.5W |
| 3213 | 4822 116 52264 | 27k 5% 0.5W |
| 3214 | 4822 117 11507 | 6k8 1% 0.1W |
| 3215 | 4822 116 52175 | 100Ω 5% 0.5W |
| 3216 | 4822 116 52201 | 75Ω 5% 0.5W |
| 3217 | 4822 116 52175 | 100Ω 5% 0.5W |
| 3218 | 4822 116 52201 | 75Ω 5% 0.5W |
| 3219 | 4822 116 52175 | 100Ω 5% 0.5W |
| 3220 | 4822 117 11149 | 82k 1% 0.1W |
| 3221 | 4822 116 52201 | 75Ω 5% 0.5W |
| 3222 | 4822 116 52175 | 100Ω 5% 0.5W |
| 3223 | 4822 116 52199 | 68Ω 5% 0.5W |
| 3224 | 4822 051 10102 | 1k 2% 0.25W |
| 3226 | 4822 116 52201 | 75Ω 5% 0.5W |
| 3227 | 4822 116 52176 | 10Ω 5% 0.5W |
| 3231 | 4822 116 83868 | 150Ω 5% 0.5W |
| 3232 | 4822 117 13579 | 220k 1% 0.1W |
| 3233 | 4822 116 83868 | 150Ω 5% 0.5W |
| 3234 | 4822 117 10834 | 47k 1% 0.1W |

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|---|---|---|
| 3236 | 4822 116 83868 | 150Ω 5% 0.5W |
| 3237 | 4822 117 13579 | 220k 1% 0.1W |
| 3238 | 4822 116 83868 | 150Ω 5% 0.5W |
| 3239 | 4822 117 10834 | 47k 1% 0.1W |
| 3241 | 4822 116 52264 | 27k 5% 0.5W |
| 3242 | 4822 117 11507 | 6k8 1% 0.1W |
| 3243 | 4822 116 52201 | 75Ω 5% 0.5W |
| 3244 | 4822 116 52175 | 100Ω 5% 0.5W |
| 3245 | 4822 116 52199 | 68Ω 5% 0.5W |
| 3246 | 4822 051 10102 | 1k 2% 0.25W |
| 3247▲ | 5322 117 11726 | 10Ω 5% |
| 3248 | 4822 116 52201 | 75Ω 5% 0.5W |
| 3249 | 4822 116 52176 | 10Ω 5% 0.5W |
| 3251 | 4822 117 13579 | 220k 1% 0.1W |
| 3252 | 4822 116 83868 | 150Ω 5% 0.5W |
| 3253 | 4822 117 13579 | 220k 1% 0.1W |
| 3254 | 4822 116 83868 | 150Ω 5% 0.5W |
| 3255 | 4822 051 20479 | 47Ω 5% 0.1W |
| 3256 | 4822 051 20479 | 47Ω 5% 0.1W |
| 3257 | 4822 051 20479 | 47Ω 5% 0.1W |
| 3263 | 4822 051 10102 | 1k 2% 0.25W |
| 3263 | 4822 117 11449 | 2k2 1% 0.1W |
| 3264 | 4822 117 10833 | 10k 1% 0.1W |
| 3267 | 4822 051 20479 | 47Ω 5% 0.1W |
| 3268 | 4822 051 20479 | 47Ω 5% 0.1W |
| 3271 | 4822 051 20333 | 33k 5% 0.1W |
| 3272 | 4822 117 10837 | 100k 1% 0.1W |
| 3273 | 4822 051 20223 | 22k 5% 0.1W |
| 3274 | 4822 051 20154 | 150k 5% 0.1W |
| 3276 | 4822 117 11449 | 2k2 1% 0.1W |
| 3277 | 4822 051 20101 | 100Ω 5% 0.1W |
| 3278 | 4822 117 11503 | 220Ω 1% 0.1W |
| 3280 | 4822 051 20333 | 33k 5% 0.1W |
| 3281 | 4822 051 20472 | 4k7 5% 0.1W |
| 3282 | 4822 117 10834 | 47k 1% 0.1W |
| 3401 | 4822 116 52175 | 100Ω 5% 0.5W |
| 3402 | 4822 050 11002 | 1k 1% 0.4W |
| 3403 | 4822 116 52269 | 3k3 5% 0.5W |
| 3403 | 4822 116 52289 | 5k6 5% 0.5W |
| 3405 | 4822 117 12473 | 4k7 5% 5W |
| 3405 | 4822 117 12517 | 5k6 5% 5W |
| 3409 | 2322 193 53333 | 33k 5% |
| 3410 | 4822 116 52191 | 33Ω 5% 0.5W |
| 3411 | 4822 053 21334 | 330k 5% 0.5W |
| 3412 | 4822 116 52251 | 18k 5% 0.5W |
| 3414 | 4822 116 52234 | 100k 5% 0.5W |
| 3417 | 4822 116 52228 | 680Ω 5% 0.5W |
| 3422 | 3198 012 11030 | 10k 5% 1W |
| 3430 | 3198 012 31590 | 15Ω 5% 3W |
| 3430 | 4822 053 12339 | 33Ω 5% 3W |
| 3435 | 4822 116 52264 | 27k 5% 0.5W |
| 3435 | 4822 116 83882 | 39k 5% 0.5W |
| 3435 | 4822 116 83884 | 47k 5% 0.5W |
| 3436 | 4822 116 52291 | 56k 5% 0.5W |
| 3436 | 4822 116 52297 | 68k 5% 0.5W |
| 3436 | 4822 116 83882 | 39k 5% 0.5W |
| 3436 | 4822 116 83884 | 47k 5% 0.5W |
| 3437 | 4822 050 23303 | 33k 1% 0.6W |
| 3437 | 4822 116 52257 | 22k 5% 0.5W |
| 3438 | 4822 051 20474 | 470k 5% 0.1W |
| 3439 | 4822 050 11002 | 1k 1% 0.4W |
| 3440 | 4822 117 10837 | 100k 1% 0.1W |
| 3441 | 4822 116 83961 | 6k8 5% |
| 3442 | 4822 051 20105 | 1M 5% 0.1W |
| 3442 | 4822 051 20824 | 820k 5% 0.1W |
| 3445▲ | 4822 052 11108 | 1Ω 5% 0.5W |
| 3446▲ | 4822 052 11108 | 1Ω 5% 0.5W |
| 3447▲ | 4822 052 11108 | 1Ω 5% 0.5W |
| 3448▲ | 4822 052 11108 | 1Ω 5% 0.5W |
| 3449▲ | 4822 052 11108 | 1Ω 5% 0.5W |
| 3450 | 4822 116 52175 | 100Ω 5% 0.5W |
| 3451 | 4822 117 10837 | 100k 1% 0.1W |
| 3456 | 4822 051 10102 | 1k 2% 0.25W |
| 3470 | 4822 050 11002 | 1k 1% 0.4W |
| 3470 | 4822 116 52264 | 27k 5% 0.5W |
| 3471 | 4822 116 83883 | 470Ω 5% 0.5W |
| 3472 | 4822 116 52234 | 100k 5% 0.5W |
| 3472 | 4822 116 52304 | 82k 5% 0.5W |
| 3473 | 4822 116 52304 | 82k 5% 0.5W |
| 3474 | 4822 050 24708 | 4Ω7 1% 0.6W |
| 3475 | 4822 050 24708 | 4Ω7 1% 0.6W |
| 3476 | 4822 116 52283 | 4k7 5% 0.5W |
| 3477 | 4822 116 52238 | 12k 5% 0.5W |
| 3478 | 4822 050 21003 | 10k 1% 0.6W |
| 3479 | 4822 116 52234 | 100k 5% 0.5W |
| 3480 | 4822 050 21003 | 10k 1% 0.6W |
| 3488 | 4822 116 52175 | 100Ω 5% 0.5W |
| 3489 | 3198 012 26880 | 6Ω8 PM5% 2W |
| 3490▲ | 4822 052 10478 | 4Ω7 5% 0.33W |
| 3491▲ | 4822 052 10478 | 4Ω7 5% 0.33W |
| 3492 | 4822 053 21334 | 330k 5% 0.5W |
| 3493 | 4822 050 21003 | 10k 1% 0.6W |
| 3494 | 4822 116 52264 | 27k 5% 0.5W |
| 3501 | 4822 051 10102 | 1k 2% 0.25W |
| 3503 | 4822 051 10102 | 1k 2% 0.25W |
| 3504 | 4822 116 52256 | 2k2 5% 0.5W |
| 3511 | 4822 116 52283 | 4k7 5% 0.5W |
| 3512 | 4822 117 10833 | 10k 1% 0.1W |
| 3513 | 4822 117 10833 | 10k 1% 0.1W |
| 3521▲ | 4822 052 10158 | 1Ω5 5% 0.33W |
| 3522 | 4822 050 21003 | 10k 1% 0.6W |
| 3523 | 4822 116 52175 | 100Ω 5% 0.5W |
| 3524 | 4822 116 52175 | 100Ω 5% 0.5W |
| 3525 | 4822 050 24708 | 4Ω7 1% 0.6W |
| 3525 | 4822 116 81154 | 2Ω2 5% 0.5W |
| 3525 | 5322 116 53564 | 3Ω3 5% 0.5W |
| 3526 | 4822 050 24708 | 4Ω7 1% 0.6W |
| 3526 | 5322 116 53564 | 3Ω3 5% 0.5W |
| 3527 | 5322 116 53564 | 3Ω3 5% 0.5W |
| 3528 | 4822 116 52256 | 2k2 5% 0.5W |
| 3701 | 4822 051 20472 | 4k7 5% 0.1W |
| 3702 | 4822 051 20472 | 4k7 5% 0.1W |
| 3703 | 4822 117 11449 | 2k2 1% 0.1W |
| 3704 | 4822 116 52291 | 56k 5% 0.5W |
| 3705 | 4822 051 20182 | 1k8 5% 0.1W |
| 3705 | 4822 051 20471 | 470Ω 5% 0.1W |
| 3706 | 4822 117 10833 | 10k 1% 0.1W |
| 3707 | 4822 117 10833 | 10k 1% 0.1W |
| 3708 | 4822 117 10837 | 100k 1% 0.1W |
| 3709 | 4822 117 11503 | 220Ω 1% 0.1W |
| 3710 | 4822 051 20392 | 3k9 5% 0.1W |
| 3711 | 4822 051 20392 | 3k9 5% 0.1W |
| 3712 | 4822 051 20822 | 8k2 5% 0.1W |
| 3713 | 4822 117 11139 | 1k5 1% 0.1W |
| 3715 | 4822 051 20332 | 3k3 5% 0.1W |
| 3716 | 4822 051 20822 | 8k2 5% 0.1W |
| 3717 | 4822 117 11139 | 1k5 1% 0.1W |
| 3719 | 4822 117 12955 | 2k7 1% 0.1W |
| 3720 | 4822 051 10102 | 1k 2% 0.25W |
| 3721 | 4822 117 10837 | 100k 1% 0.1W |
| 3722 | 4822 117 12955 | 2k7 1% 0.1W |
| 3723 | 4822 051 20332 | 3k3 5% 0.1W |
| 3724 | 4822 051 20562 | 5k6 5% 0.1W |
| 3725 | 4822 051 20562 | 5k6 5% 0.1W |
| 3726 | 4822 051 20109 | 10Ω 5% 0.1W |
| 3727 | 4822 116 52176 | 10Ω 5% 0.5W |
| 3728 | 4822 051 20109 | 10Ω 5% 0.1W |
| 3730 | 4822 051 20273 | 27k 5% 0.1W |
| 3731 | 4822 051 20273 | 27k 5% 0.1W |
| 3732 | 4822 116 52234 | 100k 5% 0.5W |
| 3733 | 4822 051 20561 | 560Ω 5% 0.1W |
| 3734 | 4822 051 20478 | 4Ω7 5% 0.1W |
| 3735 | 4822 051 20478 | 4Ω7 5% 0.1W |
| 3736▲ | 4822 052 10108 | 1Ω 5% 0.33W |
| 3737▲ | 4822 052 10108 | 1Ω 5% 0.33W |
| 3901 | 4822 053 21475 | 4M7 5% 0.5W |
| 3902 | 4822 053 21225 | 2M2 5% 0.5W |
| 3905 | 3198 013 04710 | 470Ω 2% 0.5W |
| 3907 | 4822 117 12074 | 7W 1Ω5 10% |
| 3911 | 4822 116 10075 | 9Ω 220V |
| 3913 | 2322 193 53154 | 150k 5% |
| 3915 | 4822 053 20335 | 3M3 5% 0.25W |
| 3917 | 4822 051 20561 | 560Ω 5% 0.1W |
| 3923 | 2120 106 90555 | 0Ω33 5% 1W |
| 3924 | 2120 106 90554 | 0Ω22 5% 1W |
| 3925 | 4822 116 52228 | 680Ω 5% 0.5W |
| 3926 | 4822 116 52269 | 3k3 5% 0.5W |
| 3928 | 4822 116 52263 | 2k7 5% 0.5W |
| 3929 | 5322 116 53564 | 3Ω3 5% 0.5W |
| 3931 | 4822 117 10833 | 10k 1% 0.1W |
| 3932 | 4822 117 10833 | 10k 1% 0.1W |
| 3942 | 4822 051 20122 | 1k2 5% 0.1W |
| 3943 | 4822 116 83881 | 390Ω 5% 0.5W |
| 3944 | 4822 116 52257 | 22k 5% 0.5W |
| 3946 | 4822 051 20223 | 22k 5% 0.1W |
| 3947 | 4822 051 10102 | 1k 2% 0.25W |
| 3948 | 4822 051 20683 | 68k 5% 0.1W |
| 3951 | 4822 051 20562 | 5k6 5% 0.1W |
| 3952 | 4822 117 11149 | 82k 1% 0.1W |
| 3953 | 4822 117 10833 | 10k 1% 0.1W |
| 3954 | 4822 051 20562 | 5k6 5% 0.1W |
| 3955 | 4822 117 10833 | 10k 1% 0.1W |
| 3957 | 4822 051 20182 | 1k8 5% 0.1W |
| 3958 | 4822 051 10102 | 1k 2% 0.25W |
| 3962 | 4822 051 20562 | 5k6 5% 0.1W |
| 3963 | 4822 051 20109 | 10Ω 5% 0.1W |
| 3965 | 4822 051 20229 | 22Ω 5% 0.1W |
| 3966 | 4822 117 10361 | 680Ω 1% 0.1W |
| 3967 | 4822 116 52219 | 330Ω 5% 0.5W |
| 3968 | 4822 117 12955 | 2k7 1% 0.1W |
| 3969 | 4822 050 21003 | 10k 1% 0.6W |
| 3970 | 3198 012 32290 | 22Ω 5% |
| 3977 | 4822 117 12955 | 2k7 1% 0.1W |
| 3986 | 4822 051 20333 | 33k 5% 0.1W |
| 3987 | 4822 117 10833 | 10k 1% 0.1W |
| 3989 | 4822 051 20334 | 330k 5% 0.1W |
| 3996▲ | 4822 053 21155 | 1M5 5% 0.5W |
| 4xxx | 4822 051 10008 | 0Ω 5% 0.25W |
| 4xxx | 4822 051 20008 | 0Ω 5% 0.25W |

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|---|---|---|
| 5001 | 4822 157 11828 | 22U 20% |
| 5002 | 4822 157 11828 | 22U 20% |
| 5012 | 4822 157 11771 | 0.09µH 10% |
| 5201 | 4822 157 11235 | 22U |
| 5202 | 4822 157 11235 | 22U |
| 5261 | 4822 157 11778 | 5U6 10% |
| 5262 | 4822 157 50943 | 12µH |
| 5406 | 3128 138 33811 | LINE DRIVE TRAFO |
| 5406 | 4822 146 11045 | Line DRIVER TRAFO 21" |
| 5411 | 4822 157 11411 | Bead 100MHz |
| 5417 | 3128 138 53181 | LIN. DRUM COIL |
| 5417 | 3128 138 53191 | LIN. DRUM COIL |
| 5417 | 3128 138 53201 | LIN. DRUM COIL |
| 5417 | 3128 138 53221 | LIN.DRUM COIL |
| 5430 | 4822 157 10359 | 33U |
| 5430 | 4822 157 11441 | 22U 5% |
| 5431▲ | 2422 531 02417 | LOT 1372.48A |
| 5431▲ | 2422 531 98025 | LOT SLOT 1362.04A |
| 5431▲ | 2422 531 98026 | LOT SLOT 1362.03B |
| 5431▲ | 3128 138 21001 | LOT TYPE1 |
| 5445 | 4822 157 50964 | 100µH |
| 5445 | 4822 157 52392 | 27µH |
| 5446 | 4822 157 11672 | 12µH 5% |
| 5448 | 4822 157 11672 | 12µH 5% |
| 5474 | 3128 138 31012 | Coil |
| 5475 | 3128 138 37021 | FXC COIL - CU15 |
| 5478 | 2422 531 02419 | COIL BRIDGE |
| 5521 | 4822 157 11771 | 0.09µH 10% |
| 5523 | 4822 157 11771 | 0.09µH 10% |
| 5524 | 4822 157 11771 | 0.09µH 10% |
| 5902 | 4822 157 11523 | LINE 5mH |
| 5903 | 4822 157 10999 | DMF-2830H |
| 5912 | 2422 531 02375 | Transformer SMT |
| 5920 | 4822 526 10704 | Bead 100MHz |
| 5924 | 4822 526 10704 | Bead 100MHz |
| 5936 | 4822 526 10704 | Bead 100MHz |
| 5939 | 4822 157 71401 | 27µH |
| 5941 | 4822 526 10704 | Bead 100MHz |
| 5961 | 4822 526 10704 | Bead 100MHz |
| 5971 | 4822 526 10704 | Bead 100MHz |

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|---|---|---|
| 6010 | 4822 130 83757 | BAS216 |
| 6012 | 4822 130 31983 | BAT85 |
| 6013 | 4822 130 31983 | BAT85 |
| 6264 | 4822 130 83757 | BAS216 |
| 6265 | 4822 130 83757 | BAS216 |
| 6266 | 4822 130 11397 | BAS316 |
| 6271 | 4822 130 11397 | BAS316 |
| 6273 | 4822 130 11397 | BAS316 |
| 6274 | 4822 130 11397 | BAS316 |
| 6275 | 4822 130 11397 | BAS316 |
| 6276 | 4822 130 11397 | BAS316 |
| 6278 | 4822 130 11397 | BAS316 |
| 6279 | 4822 130 10185 | UDZS5.6B |
| 6280 | 4822 130 10852 | BZX284-C6V8 |
| 6280 | 9322 107 42685 | UDZ12B |
| 6281 | 4822 130 10852 | BZX284-C6V8 |
| 6281 | 9322 107 42685 | UDZ12B |
| 6282 | 4822 130 10852 | BZX284-C6V8 |
| 6282 | 9322 107 42685 | UDZ12B |
| 6283 | 4822 130 10852 | BZX284-C6V8 |
| 6283 | 9322 107 42685 | UDZ12B |
| 6284 | 4822 130 10852 | BZX284-C6V8 |
| 6284 | 9322 107 42685 | UDZ12B |
| 6285 | 4822 130 10852 | BZX284-C6V8 |
| 6285 | 9322 107 42685 | UDZ12B |
| 6286 | 4822 130 10852 | BZX284-C6V8 |
| 6286 | 9322 107 42685 | UDZ12B |
| 6287 | 4822 130 10852 | BZX284-C6V8 |
| 6287 | 9322 107 42685 | UDZ12B |
| 6288 | 4822 130 10852 | BZX284-C6V8 |
| 6288 | 9322 107 42685 | UDZ12B |
| 6289 | 4822 130 10852 | BZX284-C6V8 |
| 6289 | 9322 107 42685 | UDZ12B |
| 6413 | 4822 130 30621 | 1N4148 |
| 6414 | 4822 130 83825 | BY328/20 |
| 6414 | 9340 559 50112 | BY228/24 |
| 6419 | 4822 130 31607 | RGP10D |

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|---|---|---|
| 6419 | 4822 130 42488 | BYD33D |
| 6420 | 4822 130 31607 | RGP10D |
| 6420 | 4822 130 42488 | BYD33D |
| 6439 | 4822 130 34379 | BZX79-B27 |
| 6440 | 4822 130 30621 | 1N4148 |
| 6442 | 4822 130 30621 | 1N4148 |
| 6445 | 4822 130 31393 | BYT52J |
| 6445 | 4822 130 42606 | BYD33J |
| 6447 | 4822 130 41602 | BYW95C |
| 6448 | 4822 130 41602 | BYW95C |
| 6467 | 4822 130 11148 | UDZ4.7B |
| 6468 | 9322 107 41685 | UDZ10B |
| 6472 | 4822 130 61219 | BZX79-B10 |
| 6474 | 9340 559 53112 | BYW95C-24 |
| 6475 | 9340 559 53112 | BYW95C-24 |
| 6480 | 4822 130 30621 | 1N4148 |
| 6481 | 3198 010 53390 | BZX79-B33 |
| 6482 | 4822 130 31393 | BYT52J |
| 6482 | 4822 130 42606 | BYD33J |
| 6483 | 4822 130 31393 | BYT52J |
| 6483 | 4822 130 42606 | BYD33J |
| 6484 | 4822 130 31393 | BYT52J |
| 6484 | 4822 130 42606 | BYD33J |
| 6485 | 4822 130 20299 | P0102DA |
| 6486 | 4822 130 34379 | BZX79-B27 |
| 6487 | 4822 130 34142 | BZX79-B33 |
| 6505 | 4822 130 31607 | RGP10D |
| 6505 | 4822 130 42488 | BYD33D |
| 6511 | 4822 130 30621 | 1N4148 |
| 6512 | 4822 130 34173 | BZX79-B5V6 |
| 6522 | 4822 130 31607 | RGP10D |
| 6522 | 4822 130 42488 | BYD33D |
| 6701 | 4822 130 30621 | 1N4148 |
| 6904 | 4822 130 34142 | BZX79-B33 |
| 6905 | 4822 130 34142 | BZX79-B33 |
| 6911 | 4822 130 31083 | BYW55 |
| 6912 | 4822 130 31083 | BYW55 |
| 6913 | 4822 130 31083 | BYW55 |
| 6914 | 4822 130 31083 | BYW55 |
| 6921 | 4822 130 34142 | BZX79-B33 |
| 6926 | 4822 130 31607 | RGP10D |
| 6926 | 4822 130 42488 | BYD33D |
| 6928 | 4822 130 31607 | RGP10D |
| 6928 | 4822 130 42488 | BYD33D |
| 6929 | 4822 130 31607 | RGP10D |
| 6929 | 4822 130 42488 | BYD33D |
| 6932 | 4822 130 30621 | 1N4148 |
| 6938 | 4822 130 10218 | BY229X-800 |
| 6941 | 4822 130 32715 | SB340 |
| 6942 | 4822 130 31607 | RGP10D |
| 6942 | 4822 130 42488 | BYD33D |
| 6953 | 4822 130 34382 | BZX79-B8V2 |
| 6955 | 4822 130 30621 | 1N4148 |
| 6961 | 4822 130 32715 | SB340 |
| 6966 | 4822 130 31981 | BZX79-B3V9 |
| 6971 | 4822 130 10256 | EGP20DL-5300 |
| 6973 | 4822 130 30621 | 1N4148 |
| 6986 | 4822 130 34281 | BZX79-B15 |

| | | |
|---|---|---|
| 7012 | 4822 130 40959 | BC547B |
| 7013 | 4822 130 44568 | BC557B |
| 7014 | 4822 130 40981 | BC337-25 |
| 7015 | 4822 130 40981 | BC337-25 |
| 7224 | 4822 130 60511 | BC847B |
| 7226 | 4822 130 60511 | BC847B |
| 7273 | 4822 130 60373 | BC856B |
| 7276 | 4822 130 60511 | BC847B |
| 7277 | 4822 130 60373 | BC856B |
| 7280 | 4822 130 60511 | BC847B |
| 7408 | 4822 130 41646 | BF423 |
| 7410 | 9340 547 93127 | BU4522AX |
| 7410 | 9340 550 89127 | BU4508AX |
| 7440 | 4822 130 44568 | BC557B |
| 7470 | 4822 130 11336 | STP16NE06FP |
| 7478 | 4822 130 40959 | BC547B |
| 7480 | 4822 130 40959 | BC547B |
| 7481 | 4822 130 42159 | BF819 |
| 7482 | 9340 547 00215 | PDTC143ZT |
| 7501 | 4822 209 61117 | TDA8172 |
| 7513 | 4822 130 60511 | BC847B |
| 7701 | 4822 130 60511 | BC847B |
| 7702 | 9322 148 81667 | AN5277 |
| 7703 | 4822 209 33165 | TDA1308T/N1 |
| 7704 | 4822 130 60511 | BC847B |
| 7710 | 4822 130 60511 | BC847B |
| 7711 | 4822 130 60373 | BC856B |
| 7712 | 4822 130 60373 | BC856B |
| 7921 | 9322 140 38682 | STR-F6454 |
| 7922 | 4822 130 60373 | BC856B |
| 7929▲ | 8238 274 02070 | TCET1103G |
| 7932 | 4822 130 60511 | BC847B |
| 7942 | 4822 209 80591 | LM317T |
| 7944 | 4822 130 60511 | BC847B |
| 7946 | 4822 130 60511 | BC847B |
| 7948 | 4822 130 60511 | BC847B |
| 7951 | 4822 130 60511 | BC847B |
| 7953 | 4822 130 60511 | BC847B |
| 7955 | 4822 130 60511 | BC847B |
| 7965 | 4822 130 40855 | BC337 |
| 7967 | 9322 137 01682 | SI-3050C |
| 7971 | 4822 209 16707 | SE140N |
| 7971 | 4822 209 17243 | SE130N |
| 7987 | 4822 130 60373 | BC856B |

## CRT [B]

### Various

| | | |
|---|---|---|
| 0084▲ | 2422 500 80052 | Conn 9P |
| 0084▲ | 2422 500 80053 | Conn 9P |
| 0084▲ | 2422 500 80061 | Conn 9P |
| 0217 | 4822 267 10735 | Conn 3P |

| | | |
|---|---|---|
| 2830 | 4822 121 51473 | 470nF 20% 63V |
| 2831 | 4822 126 13599 | 3.3nF 10% 500V |
| 2835 | 4822 126 13838 | 100nF 20% 50V |
| 2836 | 4822 121 43897 | 1nF 5% 400V |
| 2840 | 4822 124 11565 | 10µF 20% 250V |
| 2843▲ | 4822 126 13451 | 2.2nF 10% 2KV |
| 2860 | 4822 124 40207 | 100µF 20% 25V |
| 2866 | 4822 126 13482 | 470nF 20% 16V |
| 2869 | 4822 121 40334 | 100nF 10% 100V |
| 2870 | 5322 122 32654 | 22nF 10% 63V |
| 2871 | 4822 124 40764 | 22µF 100 V |
| 2872 | 4822 122 40112 | 560pF 10% 500V |
| 2872▲ | 4822 126 13829 | 120pF 10% 500V |
| 2873 | 4822 121 40516 | 22nF 10% 250V |
| 2876 | 4822 124 40248 | 10µF 20% 63V |
| 2877 | 5322 122 32448 | 10pF 5% 63V |
| 2878 | 4822 122 33172 | 390pF 5% 50V |

| | | |
|---|---|---|
| 3831 | 4822 116 52175 | 100Ω 5% 0.5W |
| 3832 | 3198 013 01020 | 1k 2% 0.5W |
| 3833 | 4822 116 52175 | 100Ω 5% 0.5W |
| 3834 | 3198 013 01020 | 1k 2% 0.5W |
| 3835 | 4822 116 52175 | 100Ω 5% 0.5W |
| 3836 | 3198 013 01020 | 1k 2% 0.5W |
| 3837 | 4822 051 20561 | 560Ω 5% 0.1W |
| 3837 | 4822 117 10361 | 680Ω 1% 0.1W |
| 3838 | 4822 051 20561 | 560Ω 5% 0.1W |
| 3838 | 4822 117 10361 | 680Ω 1% 0.1W |
| 3839 | 4822 051 20561 | 560Ω 5% 0.1W |
| 3839 | 4822 117 10361 | 680Ω 1% 0.1W |
| 3840▲ | 4822 052 10101 | 100Ω 5% 0.33W |
| 3841▲ | 4822 052 10108 | 1Ω 5% 0.33W |
| 3841▲ | 4822 052 10128 | 1Ω2 5% 0.33W |
| 3842▲ | 4822 052 10108 | 1Ω 5% 0.33W |
| 3842▲ | 4822 052 10128 | 1Ω2 5% 0.33W |
| 3843 | 3198 013 01520 | 1k5 2% 0.5W |
| 3845 | 4822 116 52272 | 330k 5% 0.5W |
| 3860▲ | 4822 052 10109 | 10Ω 5% 0.33W |
| 3864 | 4822 117 11503 | 220Ω 1% 0.1W |
| 3865 | 4822 117 10833 | 10k 1% 0.1W |
| 3866 | 4822 117 11139 | 1k5 1% 0.1W |
| 3867 | 4822 116 52176 | 10Ω 5% 0.5W |
| 3869 | 4822 051 20008 | jumper (0805) |
| 3870 | 4822 116 52231 | 820Ω 5% 0.5W |
| 3871 | 4822 116 52291 | 56k 5% 0.5W |
| 3872 | 4822 117 11148 | 56k 1% 0.1W |
| 3873 | 4822 117 11454 | 820Ω 1% 0.1W |
| 3875 | 4822 051 20122 | 1k2 5% 0.1W |
| 3876 | 4822 051 20008 | jumper (0805) |
| 3877 | 4822 051 20008 | jumper ( 0805) |
| 3878 | 4822 051 20471 | 470Ω 5% 0.1W |
| 3879 | 4822 053 12183 | 18k 5% 3W |
| 3880 | 4822 116 52176 | 10Ω 5% 0.5W |
| 3881 | 4822 051 20008 | jumper (0805) |
| 3882 | 4822 053 12183 | 18k 5% 3W |
| 3885 | 4822 117 11449 | 2k2 1% 0.1W |
| 3886 | 2322 194 63338 | 3Ω3 5% |
| 3887 | 2322 194 63338 | 3Ω3 5% |
| 3888 | 4822 051 20008 | jumper (0805) |
| 3892 | 4822 117 13016 | VDR 115V |

| | | |
|---|---|---|
| 5842 | 4822 157 11447 | 56µH |
| 5842 | 4822 157 71514 | 18u 5% |
| 5842 | 4822 157 71515 | 68u |
| 5862 | 4822 157 51216 | 5.6µH |

| | | |
|---|---|---|
| 6831 | 4822 130 30842 | BAV21 |
| 6832 | 4822 130 83757 | BAS216 |
| 6833 | 4822 130 30842 | BAV21 |
| 6835 | 4822 130 30842 | BAV21 |
| 6837 | 4822 130 82969 | BZD23-C24 |
| 6838 | 4822 130 82969 | BZD23-C24 |
| 6863 | 4822 130 30621 | 1N4148 |

| | | |
|---|---|---|
| 7830 | 9352 561 40112 | TDA6108 |
| 7830 | 9352 576 50112 | TDA6107Q/N2 |
| 7860 | 4822 130 44154 | BF199 |
| 7861 | 4822 130 42589 | BF370 |
| 7862 | 4822 130 41617 | BD830 |
| 7863 | 4822 130 41616 | BD829 |
| 7864 | 4822 130 44568 | BC557B |
| 7865 | 9340 350 20116 | BFQ151 |

## SSB [C]

### Various

| | | |
|---|---|---|
| 0238 | 2422 025 12467 | Conn 3P |
| 1327 | 2422 543 01095 | X-tal 12MHz |
| 1333 | 2422 549 44311 | cer flt TPWCC16B |
| 1451 | 2422 549 44372 | SAW flt OFWK3953L |
| 1455 | 2422 549 44369 | SAW flt OFWK9656L |
| 1630 | 2422 543 01059 | X-tal 18.432MHz |

| | | |
|---|---|---|
| 2010 | 3198 016 38210 | 820P 25V |
| 2014 | 3198 017 41050 | 1µF 10V |
| 2015 | 3198 017 41050 | 1µF 10V |
| 2016 | 4822 126 14305 | 100nF 10% 16V |
| 2017 | 4822 126 14305 | 100nF 10% 16V |
| 2018 | 4822 126 14238 | 2N2 50V |
| 2043 | 3198 030 74780 | 4U7 20% 35V |
| 2044 | 4822 126 14305 | 100nF 10% 16V |
| 2045 | 4822 126 14507 | 18pF 5% 50V |
| 2046 | 4822 126 14507 | 18pF 5% 50V |
| 2049 | 4822 126 13879 | 220nF 20% 16V |
| 2050 | 4822 122 31765 | 100pF 2% 63V |
| 2051 | 4822 126 14305 | 100nF 10% 16V |
| 2053 | 4822 124 23002 | 10µF 16V |
| 2058 | 4822 126 14305 | 100nF 10% 16V |
| 2263 | 5322 122 32268 | 470pF 10% 50V |
| 2264 | 5322 122 32268 | 470pF 10% 50V |
| 2301 | 3198 017 41050 | 1µF 10V |
| 2304 | 3198 030 74780 | 4U7 20% 35V |
| 2306 | 5322 126 11583 | 10nF 10% 50V |
| 2309 | 4822 126 14305 | 100nF 10% 16V |
| 2311 | 3198 017 41050 | 1µF 10V |
| 2312 | 5322 126 11583 | 10nF 10% 50V |
| 2313 | 4822 126 14305 | 100nF 10% 16V |
| 2314 | 4822 121 70159 | 0.1µF 16V |
| 2316 | 4822 126 14494 | 22nF 10% 25V |
| 2317 | 4822 126 13879 | 220nF 20% 16V |
| 2319 | 4822 126 14305 | 100nF 10% 16V |
| 2323 | 3198 017 42230 | 22nF 50V |
| 2324 | 4822 126 14305 | 100nF 10% 16V |
| 2325 | 3198 017 42230 | 22nF 50V |
| 2326 | 3198 017 42230 | 22nF 50V |
| 2327 | 4822 126 11671 | 33pF |
| 2328 | 4822 126 11671 | 33pF |
| 2331 | 3198 030 82280 | 2U2 20% 50V |
| 2332 | 4822 126 13879 | 220nF 20% 16V |
| 2333 | 4822 126 14305 | 100nF 10% 16V |
| 2334 | 4822 126 14494 | 22nF 10% 25V |
| 2335 | 3198 017 41050 | 1µF 10V |
| 2338 | 4822 126 14238 | 2N2 50V |
| 2342 | 4822 122 33752 | 15pF 5% 50V |
| 2342 | 4822 122 33777 | 47pF 5% 63V |
| 2345 | 4822 122 33752 | 15pF 5% 50V |
| 2345 | 4822 122 33777 | 47pF 5% 63V |

| | | |
|---|---|---|
| 2348 | 4822 122 33752 | 15pF 5% 50V |
| 2348 | 4822 122 33777 | 47pF 5% 63V |
| 2350 | 5322 124 41945 | 22µF 20% 35V |
| 2354 | 3198 017 44740 | 470nF 10V |
| 2355 | 3198 017 44740 | 470nF 10V |
| 2356 | 3198 017 44740 | 470nF 10V |
| 2357 | 4822 122 33741 | 10pF 10% 50V |
| 2360 | 5322 126 11583 | 10nF 10% 50V |
| 2372 | 4822 126 13193 | 4.7nF 10% 63V |
| 2373 | 5322 124 90403 | 1µF 50V |
| 2374 | 4822 126 14494 | 22nF 10% 25V |
| 2375 | 3198 016 31020 | 0603 25V 1nF |
| 2376 | 3198 016 31020 | 0603 25V 1nF |
| 2377 | 3198 016 31020 | 0603 25V 1nF |
| 2380 | 4822 124 23002 | 10µF 16V |
| 2401 | 3198 017 41050 | 1µF 10V |
| 2402 | 3198 017 41050 | 1µF 10V |
| 2403 | 3198 017 41050 | 1µF 10V |
| 2404 | 4822 126 14494 | 22nF 10% 25V |
| 2405 | 4822 126 14494 | 22nF 10% 25V |
| 2407 | 4822 126 14305 | 100nF 10% 16V |
| 2408 | 4822 126 14305 | 100nF 10% 16V |
| 2412 | 4822 122 31765 | 100pF 2% 63V |
| 2415 | 4822 122 31765 | 100pF 2% 63V |
| 2417 | 4822 124 23002 | 10µF 16V |
| 2420 | 4822 122 31765 | 100pF 2% 63V |
| 2421 | 4822 124 23002 | 10µF 16V |
| 2422 | 4822 126 14305 | 100nF 10% 16V |
| 2423 | 3198 017 34730 | 47nF 16V |
| 2424 | 4822 122 31765 | 100pF 2% 63V |
| 2425 | 4822 122 31765 | 100pF 2% 63V |
| 2426 | 3198 017 41050 | 1µF 10V |
| 2428 | 3198 017 34730 | 47nF 16V |
| 2433 | 5322 126 11583 | 10nF 10% 50V |
| 2434 | 5322 126 11583 | 10nF 10% 50V |
| 2441 | 4822 126 14305 | 100nF 10% 16V |
| 2442 | 4822 126 13879 | 220nF 20% 16V |
| 2443 | 5322 126 11583 | 10nF 10% 50V |
| 2444 | 5322 126 11583 | 10nF 10% 50V |
| 2445 | 5322 126 11583 | 10nF 10% 50V |
| 2446 | 5322 126 11583 | 10nF 10% 50V |
| 2447 | 5322 126 11583 | 10nF 10% 50V |
| 2449 | 4822 126 14305 | 100nF 10% 16V |
| 2450 | 4822 124 23002 | 10µF 16V |
| 2451 | 4822 124 23002 | 10µF 16V |
| 2452 | 5322 126 11583 | 10nF 10% 50V |
| 2453 | 5322 126 11583 | 10nF 10% 50V |
| 2460 | 4822 124 23002 | 10µF 16V |
| 2464 | 5322 126 11578 | 1nF 10% 50V |
| 2601 | 4822 126 13881 | 470pF 5% 50V |
| 2602 | 4822 126 14305 | 100nF 10% 16V |
| 2606 | 4822 124 23002 | 10µF 16V |
| 2607 | 4822 126 13879 | 220nF 20% 16V |
| 2610 | 5322 126 11578 | 1nF 10% 50V |
| 2611 | 5322 126 11578 | 1nF 10% 50V |
| 2612 | 5322 126 11578 | 1nF 10% 50V |
| 2613 | 5322 126 11578 | 1nF 10% 50V |
| 2614 | 4822 126 13193 | 4.7nF 10% 63V |
| 2616 | 4822 126 13193 | 4.7nF 10% 63V |
| 2617 | 3198 017 41050 | 1µF 10V |
| 2618 | 3198 017 41050 | 1µF 10V |
| 2619 | 4822 126 13193 | 4.7nF 10% 63V |
| 2620 | 3198 017 41050 | 1µF 10V |
| 2621 | 3198 017 41050 | 1µF 10V |
| 2622 | 4822 124 23002 | 10µF 16V |
| 2623 | 4822 124 23002 | 10µF 16V |
| 2624 | 4822 126 14305 | 100nF 10% 16V |
| 2625 | 5322 124 41945 | 22µF 20% 35V |
| 2626 | 3198 017 41050 | 1µF 10V |
| 2627 | 3198 017 41050 | 1µF 10V |
| 2628 | 4822 126 14305 | 100nF 10% 16V |
| 2629 | 4822 124 23002 | 10µF 16V |
| 2631 | 3198 017 41050 | 1µF 10V |
| 2632 | 4822 126 13193 | 4.7nF 10% 63V |
| 2633 | 3198 017 41050 | 1µF 10V |
| 2634 | 4822 126 13193 | 4.7nF 10% 63V |
| 2635 | 3198 017 41050 | 1µF 10V |
| 2636 | 4822 126 13193 | 4.7nF 10% 63V |
| 2637 | 3198 017 41050 | 1µF 10V |
| 2638 | 4822 126 13193 | 4.7nF 10% 63V |
| 2639 | 4822 126 13193 | 4.7nF 10% 63V |
| 2640 | 3198 017 41050 | 1µF 10V |
| 2641 | 4822 126 13193 | 4.7nF 10% 63V |
| 2642 | 3198 017 41050 | 1µF 10V |
| 2643 | 3198 017 41050 | 1µF 10V |
| 2646 | 3198 017 41050 | 1µF 10V |
| 2651 | 4822 126 14305 | 100nF 10% 16V |
| 2652 | 3198 017 41050 | 1µF 10V |
| 2653 | 3198 017 41050 | 1µF 10V |
| 2655 | 4822 126 13193 | 4.7nF 10% 63V |
| 2656 | 4822 126 13193 | 4.7nF 10% 63V |
| 2657 | 4822 124 23002 | 10µF 16V |
| 2661 | 4822 126 14305 | 100nF 10% 16V |
| 2662 | 4822 124 23002 | 10µF 16V |
| 2663 | 4822 122 33777 | 47pF 5% 63V |
| 2664 | 4822 126 14225 | 56pF 5% 50V |
| 2665 | 4822 126 11669 | 27pF |
| 2666 | 4822 126 14508 | 180pF 5% 50V |
| 2667 | 4822 122 33752 | 15pF 5% 50V |
| 2675 | 3198 016 33380 | 3P3 50V |
| 2676 | 3198 016 33380 | 3P3 50V |
| 2678 | 3198 017 41050 | 1µF 10V |
| 2679 | 4822 126 14305 | 100nF 10% 16V |
| 2682 | 3198 017 41050 | 1µF 10V |
| 2683 | 3198 017 41050 | 1µF 10V |
| 2684 | 3198 017 41050 | 1µF 10V |
| 2685 | 3198 017 41050 | 1µF 10V |
| 2686 | 3198 017 41050 | 1µF 10V |
| 2687 | 3198 017 41050 | 1µF 10V |
| 2690 | 3198 017 41050 | 1µF 10V |
| 2691 | 3198 017 41050 | 1µF 10V |
| 2692 | 3198 017 41050 | 1µF 10V |
| 2693 | 3198 017 41050 | 1µF 10V |
| 2694 | 3198 017 41050 | 1µF 10V |
| 2695 | 3198 017 41050 | 1µF 10V |

| | | |
|---|---|---|
| 3002 | 4822 117 12902 | 8k2 1% 0.063W |
| 3003 | 4822 051 30103 | 10k 5% 0.062W |
| 3004 | 4822 117 12902 | 8k2 1% 0.063W |
| 3007 | 4822 117 12902 | 8k2 1% 0.063W |
| 3008 | 4822 117 12902 | 8k2 1% 0.063W |
| 3009 | 4822 117 12902 | 8k2 1% 0.063W |
| 3010 | 4822 051 30102 | 1k 5% 0.062W |
| 3013 | 4822 117 12902 | 8k2 1% 0.063W |
| 3014 | 4822 117 12902 | 8k2 1% 0.063W |
| 3015 | 4822 051 30103 | 10k 5% 0.062W |
| 3017 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3018 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3019 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3021 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3022 | 4822 051 30222 | 2k2 5% 0.062W |
| 3023 | 4822 117 12902 | 8k2 1% 0.063W |
| 3024 | 4822 051 30102 | 1k 5% 0.062W |
| 3028 | 4822 117 12925 | 47k 1% 0.063W |
| 3029 | 4822 051 30103 | 10k 5% 0.062W |
| 3030 | 4822 051 30102 | 1k 5% 0.062W |
| 3031 | 4822 051 30471 | 470Ω 5% 0.062W |
| 3032 | 4822 051 30103 | 10k 5% 0.062W |
| 3033 | 4822 051 30103 | 10k 5% 0.062W |
| 3034 | 4822 117 12925 | 47k 1% 0.063W |
| 3035 | 4822 051 30471 | 470Ω 5% 0.062W |
| 3042 | 4822 051 30151 | 150Ω 5% 0.062W |
| 3043 | 4822 051 30151 | 150Ω 5% 0.062W |
| 3044 | 4822 051 30103 | 10k 5% 0.062W |
| 3045 | 4822 051 30272 | 2k7 5% 0.062W |
| 3046 | 4822 051 30472 | 4k7 5% 0.062W |
| 3051 | 4822 117 13525 | 24k 1% 0.62W |
| 3052 | 4822 051 30472 | 4k7 5% 0.062W |
| 3054 | 4822 051 30103 | 10k 5% 0.062W |
| 3055 | 4822 051 30103 | 10k 5% 0.062W |
| 3056 | 4822 117 12925 | 47k 1% 0.063W |
| 3057 | 4822 051 30103 | 10k 5% 0.062W |
| 3058 | 4822 051 30471 | 470Ω 5% 0.062W |
| 3059 | 4822 051 30151 | 150Ω 5% 0.062W |
| 3061 | 4822 051 30471 | 470Ω 5% 0.062W |
| 3062 | 4822 051 30472 | 4k7 5% 0.062W |
| 3063 | 4822 051 30102 | 1k 5% 0.062W |
| 3064 | 4822 051 30472 | 4k7 5% 0.062W |
| 3065 | 4822 051 30472 | 4k7 5% 0.062W |
| 3066 | 4822 117 12902 | 8k2 1% 0.063W |
| 3067 | 4822 051 30102 | 1k 5% 0.062W |
| 3081 | 4822 051 30472 | 4k7 5% 0.062W |
| 3082 | 4822 051 30103 | 10k 5% 0.062W |
| 3083 | 4822 051 30471 | 470Ω 5% 0.062W |
| 3084 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3085 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3086 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3088 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3090 | 4822 051 30103 | 10k 5% 0.062W |
| 3091 | 4822 051 30103 | 10k 5% 0.062W |
| 3092 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3094 | 4822 051 30103 | 10k 5% 0.062W |
| 3302 | 4822 051 20561 | 560Ω 5% 0.1W |
| 3303 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3306 | 4822 051 30102 | 1k 5% 0.062W |
| 3311 | 4822 051 30273 | 27k 5% 0.062W |
| 3312 | 4822 051 30103 | 10k 5% 0.062W |
| 3315 | 4822 051 30393 | 39k 5% 0.062W |
| 3316 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3316 | 4822 051 30681 | 680Ω 5% 0.062W |
| 3324 | 4822 051 30391 | 390Ω 5% 0.062W |
| 3326 | 4822 051 30102 | 1k 5% 0.062W |
| 3327 | 4822 051 20561 | 560Ω 5% 0.1W |
| 3329 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3330 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3331▲ | 4822 117 11748 | NFR 2Ω2 |
| 3332▲ | 4822 117 11748 | NFR 2Ω2 |
| 3333 | 4822 051 30681 | 680Ω 5% 0.062W |
| 3334 | 4822 051 30471 | 470Ω 5% 0.062W |
| 3335 | 4822 051 30121 | 120Ω 5% 0.062W |
| 3339 | 4822 051 30103 | 10k 5% 0.062W |
| 3340 | 4822 051 20561 | 560Ω 5% 0.1W |
| 3341 | 4822 051 30151 | 150Ω 5% 0.062W |
| 3341 | 4822 051 30479 | 47Ω 5% 0.062W |
| 3342 | 3198 021 90030 | jumper 0603 |
| 3342 | 4822 051 30008 | jumper |
| 3344 | 4822 051 30151 | 150Ω 5% 0.062W |
| 3344 | 4822 051 30479 | 47Ω 5% 0.062W |
| 3345 | 3198 021 90030 | jumper 0603 |
| 3345 | 4822 051 30008 | jumper |
| 3348 | 4822 051 30151 | 150Ω 5% 0.062W |
| 3348 | 4822 051 30479 | 47Ω 5% 0.062W |
| 3349 | 3198 021 90030 | jumper 0603 |
| 3349 | 4822 051 30008 | jumper |
| 3358 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3360 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3361 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3362 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3363 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3364 | 4822 051 30102 | 1k 5% 0.062W |
| 3365 | 4822 051 20561 | 560Ω 5% 0.1W |
| 3371 | 4822 051 30153 | 15k 5% 0.062W |
| 3372 | 4822 051 30109 | 10Ω 5% 0.062W |
| 3373 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3374 | 4822 051 30332 | 3k3 5% 0.062W |
| 3375 | 4822 051 30102 | 1k 5% 0.062W |
| 3376 | 4822 051 30102 | 1k 5% 0.062W |
| 3377 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3378 | 4822 051 30102 | 1k 5% 0.062W |
| 3381 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3382 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3383 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3387 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3388 | 4822 051 30479 | 47Ω 5% 0.062W |
| 3401 | 3198 021 90030 | jumper 0603 |
| 3401 | 4822 051 30008 | jumper |
| 3402 | 3198 021 90030 | jumper 0603 |
| 3402 | 4822 051 30008 | jumper |
| 3403 | 3198 021 90030 | jumper 0603 |
| 3403 | 4822 051 30008 | jumper |
| 3404 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3405 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3406 | 4822 051 30103 | 10k 5% 0.062W |
| 3407 | 4822 051 30103 | 10k 5% 0.062W |
| 3408 | 4822 051 30103 | 10k 5% 0.062W |
| 3411 | 4822 117 12925 | 47k 1% 0.063W |
| 3412 | 4822 117 12925 | 47k 1% 0.063W |
| 3413 | 4822 051 20561 | 560Ω 5% 0.1W |
| 3414 | 4822 117 12925 | 47k 1% 0.063W |
| 3415 | 4822 117 12925 | 47k 1% 0.063W |
| 3416 | 4822 051 20561 | 560Ω 5% 0.1W |
| 3417 | 4822 051 30102 | 1k 5% 0.062W |
| 3418 | 4822 051 20561 | 560Ω 5% 0.1W |
| 3419 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3420 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3423 | 4822 051 30102 | 1k 5% 0.062W |
| 3425 | 4822 051 30102 | 1k 5% 0.062W |
| 3426 | 4822 051 30102 | 1k 5% 0.062W |
| 3427 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3428 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3432 | 3198 021 90030 | jumper 0603 |
| 3432 | 4822 051 30008 | jumper |
| 3435 | 4822 051 30223 | 22k 5% 0.062W |
| 3436 | 4822 051 30333 | 33k 5% 0.062W |
| 3439 | 4822 051 30103 | 10k 5% 0.062W |
| 3443 | 3198 021 90030 | jumper 0603 |
| 3443 | 4822 051 30008 | jumper |
| 3444 | 4822 117 12891 | 220k 1% |
| 3453 | 3198 021 90030 | jumper 0603 |
| 3453 | 4822 051 30008 | jumper |
| 3455 | 4822 051 30682 | 6k8 5% 0.062W |
| 3456 | 4822 051 30222 | 2k2 5% 0.062W |
| 3457 | 4822 051 30273 | 27k 5% 0.062W |
| 3458 | 4822 051 30183 | 18k 5% 0.062W |
| 3461 | 4822 051 30222 | 2k2 5% 0.062W |
| 3471 | 3198 021 90030 | jumper 0603 |
| 3471 | 4822 051 30008 | jumper |
| 3472 | 3198 021 90030 | jumper 0603 |
| 3472 | 4822 051 30008 | jumper |
| 3473 | 3198 021 90030 | jumper 0603 |

# A10E

**AA** 01.01

Service
Service
**Service**

# Service Information

In this service information you will find corrections on the A10E service manual (3122 785 10430) and information on new items.

## Corrections

- See attached '*Errata Sheet*' for an overview of the errors and its corrections.
- *Chapter 8 Electrical Alignments*, as given in the A10E Service Manual, was not complete. Attached find a new corrected version.
- Pin numbering on LSP silkscreen is not correct. All pins (except 1, 2, 79 and 80) are shifted one position to the right. This means for instance that pin 20 is in fact pin 18, pin 19 is pin 17, pin 40 is pin 38, etc.

## New

- During production, the following new panels are introduced:
  - A new LSP panel. The diagram, print layout and parts list are given in this document.
  - A new CRT panel. The diagram, print layout and parts list are given in this document.
- After the layout change of the LSP, the set can not be forced into Service Default Mode (SDM) anymore by shorting the jumper wires 9261 and 9262. This because position nr. 3286 was added (see attached diagram A4, location F9), but is not used. Therefor point 9261 is floating. A possible service solution is:
  - Place a resistor of 1k8 (4822 051 20182) on pos. 3286. Now, the SDM can be reached via the 'normal' method.

- A special '*service extension board*' for the A10 Small Signal Board (SSB) has been introduced under nr. 9965 000 07933.
  **Note:** This version is not the same as used for the EMG sets !

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PHILIPS

**ERRATA SHEET**

| Subject (page) | Location | Correction | |
|---|---|---|---|
| | | **Present situation** | **Corrected situation** |
| Chapter 1 (2) | 1.1.1 Reception | | Add **NTSC** |
| | Stdby consumpt. | <= 3 W | < 3 W |
| | 1.2.2 EXT2 | 10- | 10- **Easy link** |
| Overviews (26) | SSB comp. side | Testpoint V2 at pin 26 of IC7301 | Testpoint V2 at pin **54** of IC7301 |
| | IC overview | IC overview | **$I^2C$** overview |
| Diagram A1 (28) | B1 | Degassing coil | **Degaussing** coil |
| Diagram A4 (31) | A3 | To 0226 of SSB-connector [C6] | To 0226 of SSB-connector [**C8**] |
| | E1 | A6-31 | A6-**30** |
| | G2 | A6-34 'AUDIO-C' | A6-34 '**AUDIO-SURR**' |
| | G5 | A6-51 'AUDIO-SURR' | A6-51 '**AUDIO-C**' |
| Diagram A6 (33) | G2 | A4-34 'AUDIO-C' | A4-34 '**AUDIO-SURR**' |
| | H2 | A4-51 'AUDIO-SURR' | A4-51 '**AUDIO-C**' |
| Diagram C2 (41) | C1 | C2-78 | **C1**-78 |
| Diagram C4 (44) | D7 | Internal circuit 7064 is wrong | See A10E-DPL manual page 29 |
| | F10 | To memory [C4] | To memory [**C5**] |
| | H1/H2 | To SSB connector [C7] | To SSB connector [**C8**] |
| Diagram C6 (45) | D11 | 'AUDIO-SURR' C8-56 | '**AUDIO-C**' C8-56 |
| | D11 | 'AUDIO-C' C8-57 | '**AUDIO-SURR**' C8-57 |
| Diagram C8 (47) | F2 | C6-56 'AUDIO-SURR' | C6-56 '**AUDIO-C**' |

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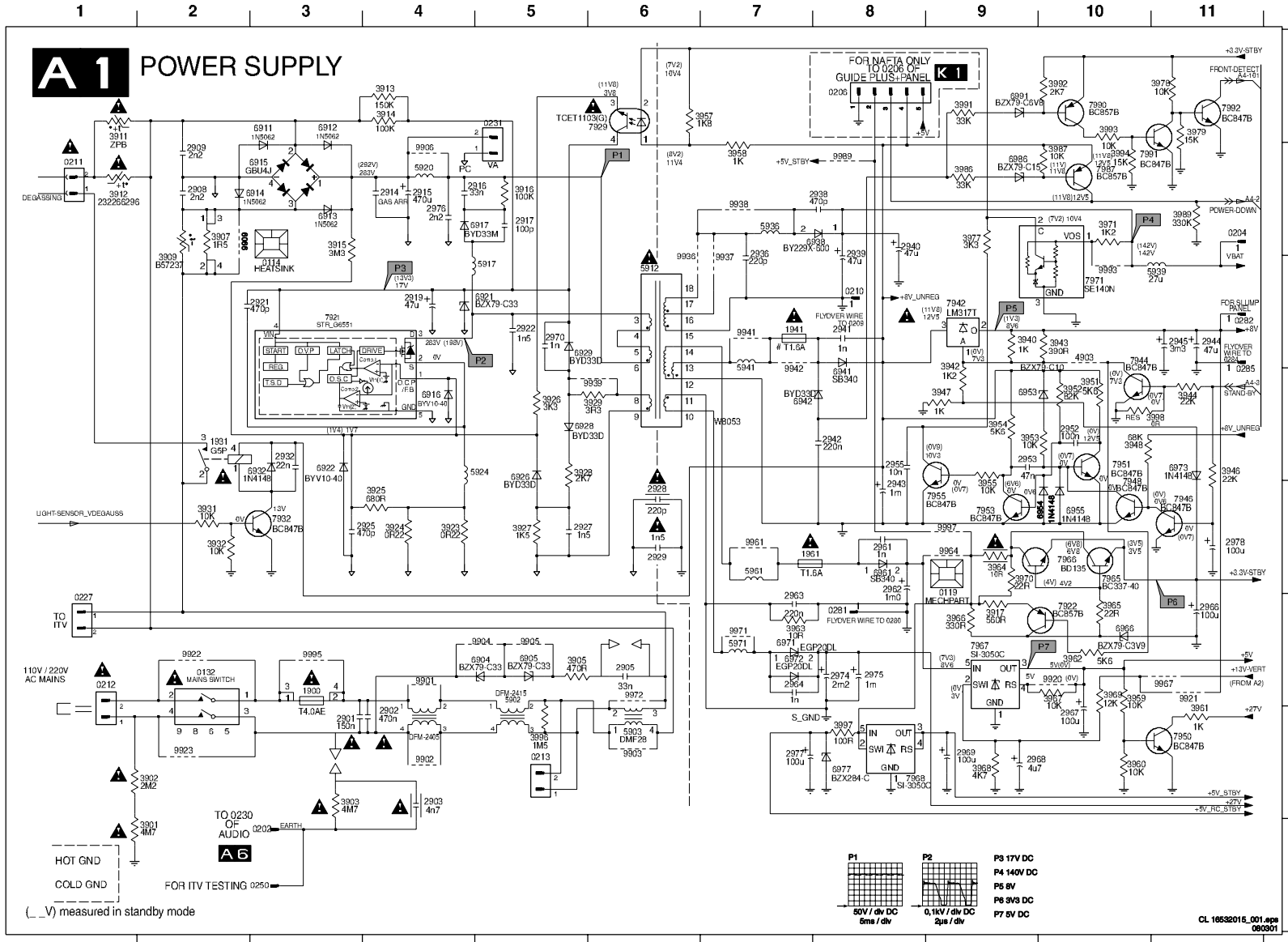
# Schematics And PWB's

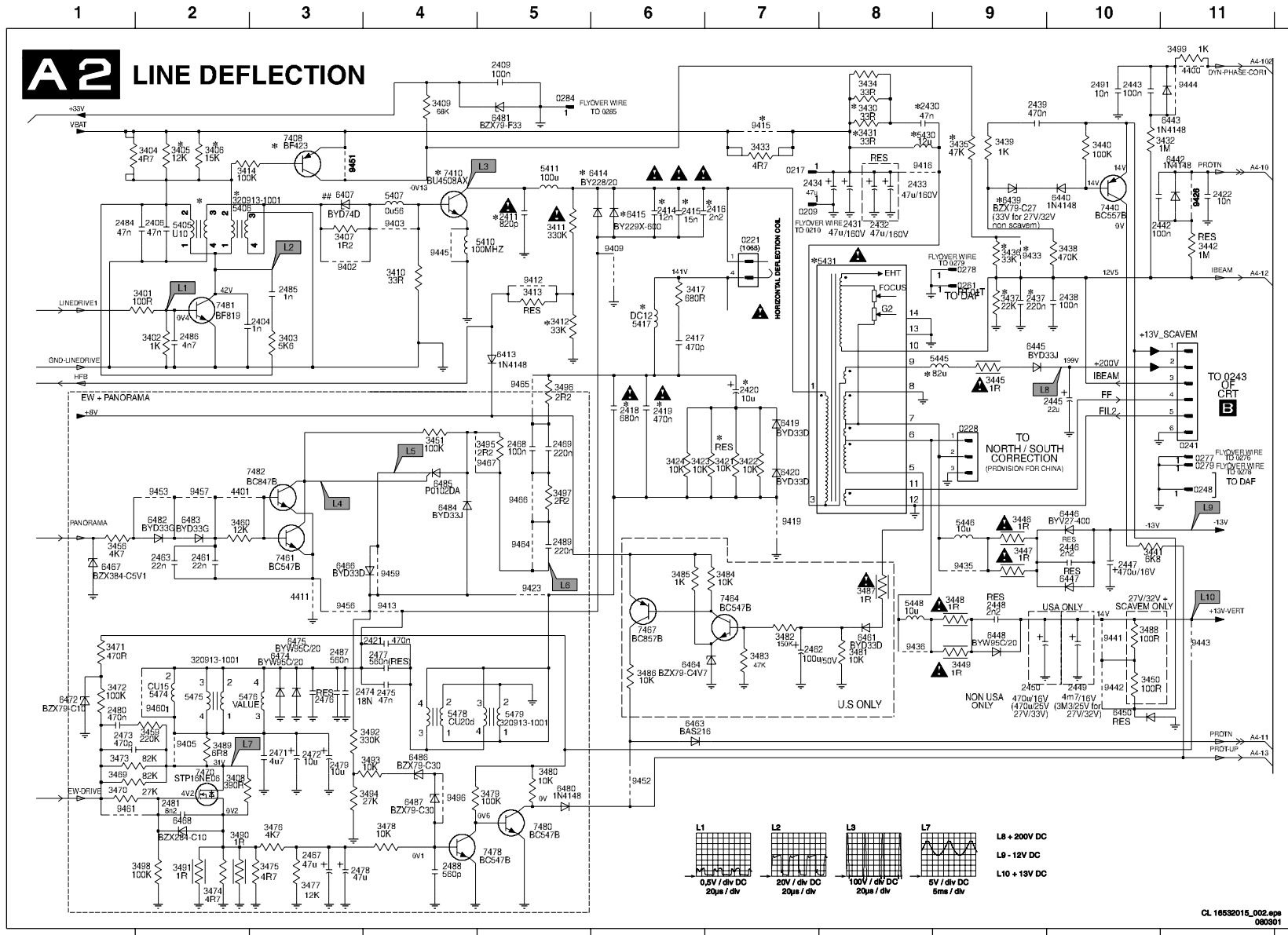
## Power Supply





0114 C3 3954 D9 9905 F5
0119 F9 3955 E9 9906 B4
0132 F2 3957 A7 9909 B2
0202 H3 3958 B7 9920 F10
0204 B11 3959 F10 9921 F11
0206 A8 3960 G10 9922 F2
0210 C8 3961 F11 9923 G2
0211 B1 3962 F10 9936 B6
0212 F1 3963 F7 9937 B7
0213 G5 3964 E9 9938 B7
0227 F1 3965 F10 9939 D6
0231 A5 3966 F9 9941 C7
0250 H3 3967 F10 9942 D7
0281 F8 3968 G9 9961 E7
0282 C11 3969 F10 9964 E9
0285 D11 3970 E9 9967 F11
1900 F3 3971 B10 9971 F7
1931 D2 3977 B9 9972 F6
1941 C7 3978 A11 9989 B8
1961 E7 3979 A11 9993 C10
2901 G3 3986 B9 9995 F3
2902 G4 3987 B10 9997 E9
2903 G4 3989 B11
2905 F6 3991 A9
2908 B2 3992 A10
2909 B2 3993 A10
2914 B4 3994 B10
2915 B4 3996 G5
2916 B5 3997 G8
2917 B5 3998 D11
2919 C4 4903 C10
2921 C3 5902 F5
2922 C5 5903 G6
2925 E4 5912 C6
2927 E5 5917 C5
2928 E6 5920 B4
2929 E6 5924 D5
2932 D3 5936 B7
2936 B7 5939 C11
2938 B8 5941 D7
2939 B8 5961 E7
2940 B8 5971 F7
2941 C8 6904 F5
2942 D8 6905 F5
2943 E8 6911 A3
2944 C11 6912 A3
2945 C11 6913 B3
2952 D10 6914 B3
2953 D9 6915 B3
2955 D8 6916 D4
2961 E8 6917 B5
2962 E8 6921 C5
2963 F7 6922 D3
2964 F7 6926 D5
2966 F11 6928 D5
2967 G10 6929 C5
2968 G9 6932 D3
2969 G9 6938 B6
2970 C5 6941 D8
2974 F8 6942 D7
2975 F8 6953 D9
2976 B4 6954 E10
2977 G7 6955 E10
2978 E11 6961 E8
3901 H2 6966 F10
3902 G2 6971 F7
3903 G3 6972 F7
3905 F5 6973 D11
3907 B2 6977 G8
3909 B2 6986 B9
3911 A1 6991 A9
3912 B1 7921 C3
3913 A4 7922 F10
3914 A4 7929 A6
3915 B3 7932 E3
3916 B5 7942 C9
3917 F9 7944 C10
3923 E4 7945 E11
3924 E4 7948 E10
3925 E4 7950 G11
3926 D5 7951 D10
3927 E5 7953 E9
3928 D5 7955 E9
3928 D6 7965 E10
3931 E2 7966 E10
3932 E2 7967 F9
3940 C9 7968 G8
3942 D9 7971 C10
3943 C10 7987 B10
3944 D11 7990 A10
3946 D11 7991 B10
3947 D9 7992 A11
3948 D10 9901 F4
3951 D10 9902 G4
3952 D10 9903 G6
3953 D9 9904 F5

## Line Deflection




0209 B7
0217 A7
0221 B7
0228 D9
0241 D11
0248 D11
0261 B9
0277 D11
0278 B9
0279 D11
0284 A5
2404 C3
2406 B2
2409 A5
2411 B5
2414 B6
2415 B6
2416 B7
2417 C6
2418 C6
2419 C6
2420 C7
2421 E4
2422 A11
2430 A8
2431 B8
2432 B8
2433 A8
2434 A7
2437 B9
2438 B10
2439 A9
2442 B11
2443 A10
2445 C10
2446 E10
2447 E10
2448 E9
2449 F10
2450 F9
2461 E2
2462 E7
2463 E2
2467 G3
2468 D5
2469 D5
2471 F3
2472 F3
2473 F1
2474 F4
2475 F4
2476 F3
2477 F4
2478 G3
2479 F3
2480 F1
2481 G2
2484 B1
2485 B3
2486 C2
2487 E3
2488 G4
2489 E5
2491 A10
3401 B2
3402 C2
3403 C3
3404 A2
3405 A2
3406 A2
3407 B3
3408 G2
3409 A4
3410 B4
3411 B5
3412 C5
3413 B5
3414 A2
3417 B6
3421 D7
3422 D7
3423 D6
3424 D6
3430 A8
3431 A8
3432 A11
3433 A7
3434 A8
3435 A9
3436 B9
3437 B9
3438 B10
3439 A9
3440 A10
3441 E10
3442 B11
3445 C9
3446 D9
3448 E9
3449 F9
3450 F10
3455 E1
3459 F2
3460 D2
3469 G1
3470 G1
3471 E1
3472 F1
3473 F1
3474 G2
3475 G3
3476 G3
3477 G3
3478 G4
3479 G5
3480 G5
3481 E8
3482 E7
3483 F7
3484 E7
3485 E6
3486 E8
3487 E8
3488 E10
3489 F2
3490 G2
3491 G2
3492 F4
3493 F4
3494 G4
3495 D5
3496 C5
3497 D5
3498 G2
3499 A11
4400 A11
4401 D2
4411 E3
5405 B2
5406 B2
5407 B4
5410 B5
5411 A5
5417 C6
5430 A8
5431 B7
5445 C9
5446 D9
5448 E8
5474 F2
5475 F2
5476 F2
5478 F4
5479 F5
6407 B3
6413 C5
6414 A6
6415 B6
6419 D7
6420 D7
6439 B9
6440 B10
6442 A11
6443 A11
6445 C9
6446 D10
6447 E10
6448 E9
6450 F10
6461 E8
6463 F6
6464 F5
6466 E3
6467 E1
6468 G2
6472 F1
6474 F3
6475 E3
6480 G5
6481 A5
6482 B2
6483 D2
6484 D4
6485 D4
6486 F4
6487 G4
7408 A3
7410 A4
7440 B10
7461 E3
7464 E7
7467 E6
7470 G2
7478 G5
7480 G5
7481 C2
7482 D2
9402 B3
9403 B4
9405 F2
9409 B6
9412 B5
9413 E4
9415 A7
9416 A8
9419 D7
9423 E5
9426 B11
9433 B9
9435 E9
9436 E8
9441 E10
9442 F10
9443 E8
9444 A11
9445 B4
9451 A3
9452 G6
9453 D2
9456 E3
9457 D2
9458 E4
9459 F2
9460 F4
9461 G1
9464 E5
9465 C5
9466 D5
9467 D5
9496 G4

## Diversity Table Diagram A2

| ITEM | 24PW6005 | 28PT5605 | 28PW8305 | 28PW8516 | 70WA8215 | 29PT5516 | 32PW8305 | 32PW8516 | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|
| 2271 | | X | X | X | | | X | X | 1U 20% 50V |
| 2281 | X | X | X | | X | | X | | 15P NP0 50V |
| 2281 | | | | X | | | | X | 220P NP0 50V |
| 2411 | X | | | | | | | | 1N 10% 2KV |
| 2411 | | | X | | | | | | 1N2 10% 2KV |
| 2411 | | X | | | X | | X | | 1N5 10% 2KV |
| 2411 | | | | X | | | | | 1N8 10% 2KV |
| 2411 | | | | | | | | X | 2N2 10% 2KV |
| 2415 | | | | | | | | X | 10N 5% 1.6KV |
| 2415 | | X | | X | | | | | 11N 5% 1.6KV |
| 2415 | X | | X | | X | | X | | 12N 5% 1.6KV |
| 2416 | | | | X | | | | X | 820P 10% 2KV |
| 2416 | | | | | | | X | | 1N 10% 2KV |
| 2416 | | | | | X | | | | 1N2 10% 2KV |
| 2416 | X | | | | | | | | 2N2 10% 2KV |
| 2416 | | | X | | | | | | 1N8 10% 2KV |
| 2418 | X | | X | | X | | | | 680N 5% 250V |
| 2418 | | | | | | | X | | 820N 5% 250V |
| 2419 | | X | | | | | | | 390N 5% 250V |
| 2419 | | | | X | | | | X | 470N 5% 250V |
| 2419 | | | | X | | | | X | 470N 5% 250V |
| 2420 | | X | X | | X | | | | 4U7 20% 250V |
| 2420 | X | | | X | | | X | X | 2U2 20% 160V |
| 2430 | | | X | X | | | X | X | 27N 10% 50V |
| 2430 | X | X | | | X | | | | 10N 10% 50V |
| 2437 | X | | | | | | | | 100N 10% 250V |
| 2437 | | X | X | | X | | | | 150N 10% 250V |
| 2437 | | | | | | | X | X | 220N 10% 250V |
| 2437 | | | | X | | | | | 180N 10% 250V |
| 2443 | | | X | | | | | | 100N Y5V 25V |
| 2461 | X | | X | X | X | | X | X | 100N 10% 50V |
| 2463 | X | | X | X | X | | X | X | 100N 10% 50V |
| 2469 | X | | X | | X | | X | | 220N 5% 250V |
| 2469 | | | | X | | | | X | 68N 5% 400V |
| 2471 | | | | | | X | | | 4U7 10% 100V |
| 2474 | | X | | | | | | | 18N 10% 630V |
| 2475 | X | X | X | X | X | | X | X | 47N 10% 250V |
| 2476 | X | | | | X | | X | X | 7N5 5% 1.6KV |
| 2476 | | | | X | | | | | 8N2 5% 1.6KV |
| 2476 | | | X | | | | | | 9N1 5% 1.6KV |
| 2479 | | | | X | | | | X | 1U 20% 160V |
| 2479 | X | X | X | | X | | X | | 10U 20% 100V |
| 2487 | X | X | | X | X | | X | X | 7N5 5% 1.6KV |
| 2487 | | | X | | | | | | 9N1 5% 1.6KV |
| 2488 | X | X | X | X | X | | X | X | 100N 16V 0805 |
| 2489 | X | | X | X | X | | X | X | 220N 5% 250V |
| 2491 | | | X | | | | | | 220N Y5V 25V |
| 3220 | | | | | | | | X | 150K 5% 0805 |
| 3220 | | | X | | | | | | 220K 5% 0805 |
| 3220 | X | X | | X | X | | X | | 82K 5% 0805 |
| 3271 | X | | X | X | X | | X | X | 33K 5% 0805 |
| 3271 | | X | | | | | | | 82K 5% 0805 |
| 3272 | | | X | X | | | X | X | 10K 5% 0805 |
| 3272 | | X | | | | | | | 2K2 5% 0805 |
| 3405 | X | | | X | X | | | X | 4K7 5% 5W |
| 3405 | | | X | | | | X | | 5K6 5% 5W |
| 3405 | | X | | | | | | | 6K8 5% 5W |
| 3412 | X | X | X | X | X | | X | | 100K 5% 1/6W |
| 3430 | X | | | X | X | | X | X | 33R 5% 3W |
| 3430 | | X | X | | | | | | 68R 5% 3W |
| 3432 | | | X | | | | | | 820K 5% 0805 |
| 3434 | | X | X | | | | | | 68R 5% 3W |
| 3435 | | | | | | | X | | 27K 5% 1/6W |
| 3435 | | X | X | X | | | | X | 39K 5% 1/6W |
| 3435 | X | | | | X | | | | 47K 5% 1/6W |
| 3436 | | | X | X | | | | | 39K 5% 1/6W |
| 3436 | | | | | | | | X | 47K 5% 1/6W |
| 3436 | | | | | | | X | | 56K 5% 1/6W |
| 3436 | X | X | | | X | | | | 68K 5% 1/6W |
| 3437 | | | X | X | | | X | X | 22K 5% 1/6W |
| 3437 | X | X | | | X | | | | 33K 5% 1/6W |
| 3442 | | | | | | | | X | 560K 5% 0805 |
| 3442 | | | X | | | | X | | 820K 5% 0805 |
| 3442 | | | | X | | | | | 560K 5% 0805 |
| 3442 | X | X | | | X | | | | 1M 5% 0805 |

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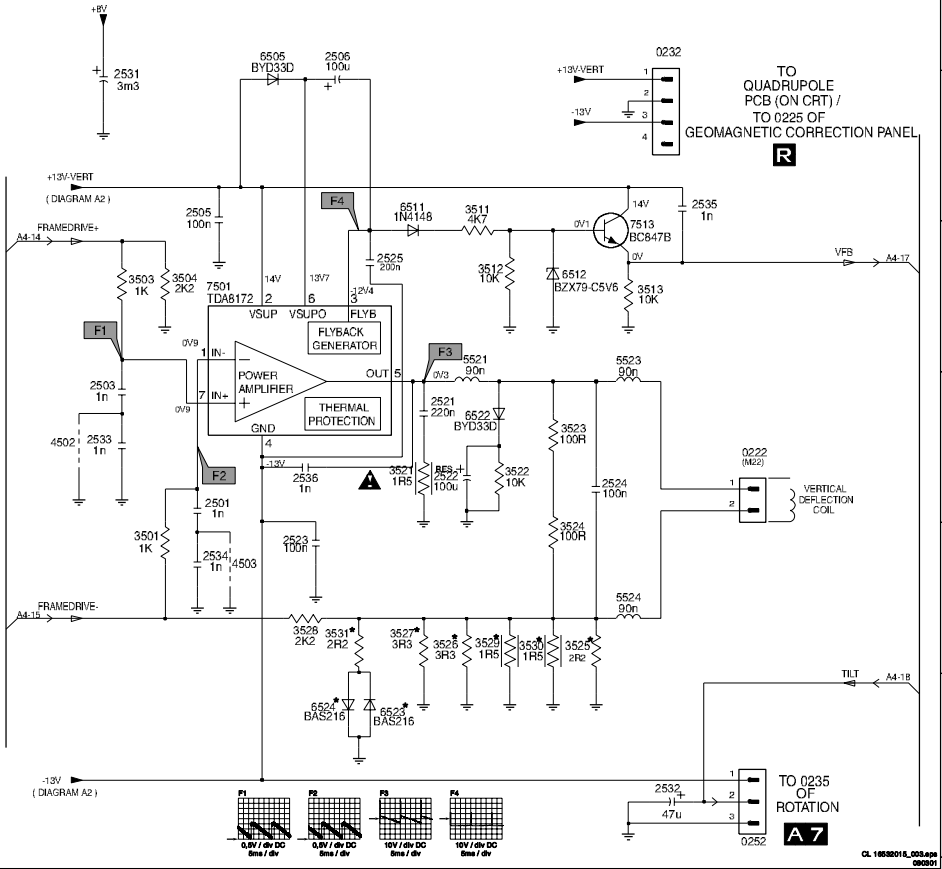
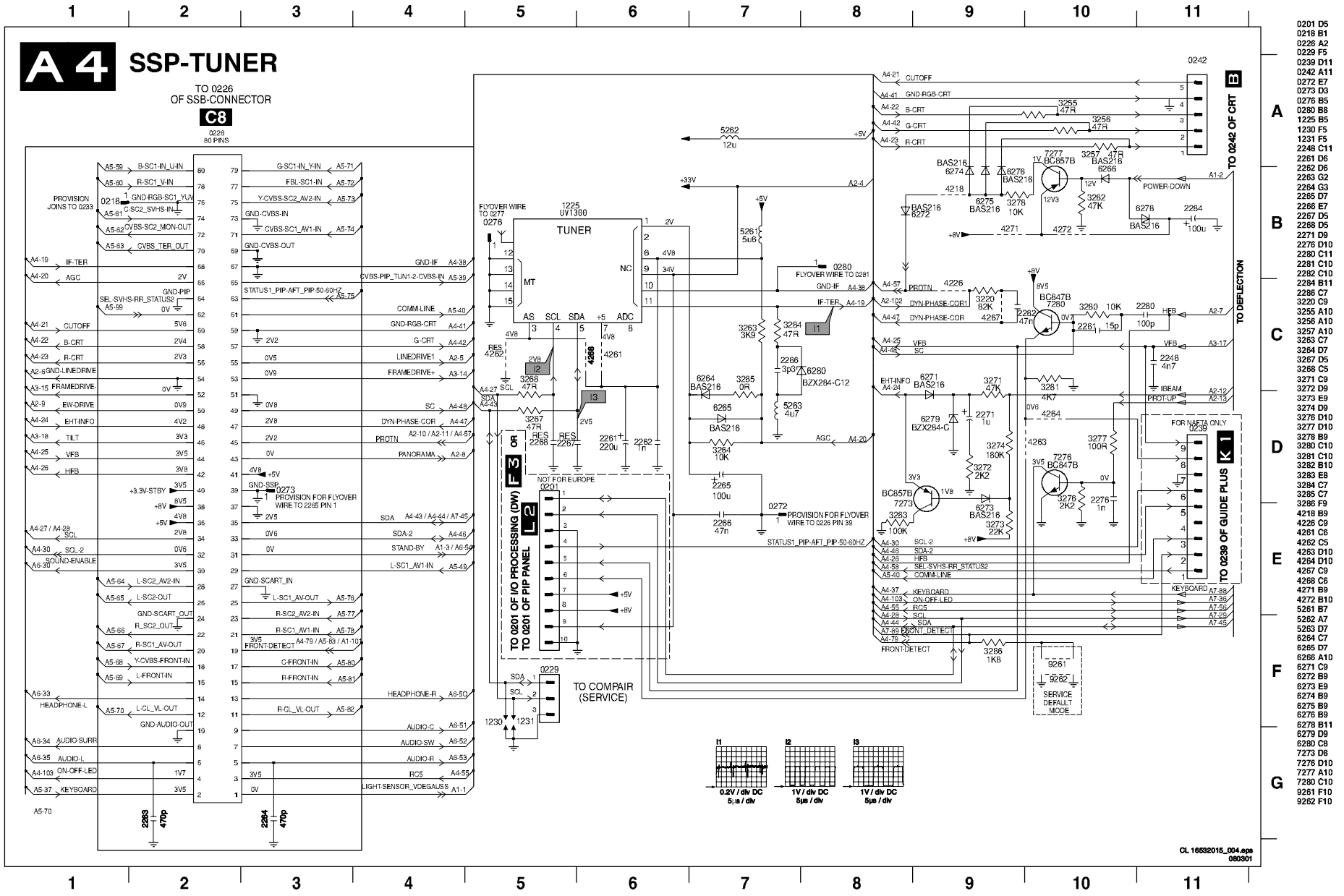
# A3 FRAME DEFLECTION

| Subject (page) | Location | Correction | |
|---|---|---|---|
| | | Present situation | Corrected situation |
| Chapter 1 (2) | 1.1.1 Reception | | Add NTSC |
| | Stdby consumpt. | <= 3 W | < 3 W |
| | 1.2.2 EXT2 | 10- | 10- Easy link |
| Overviews (25) | SSB comp. side | Testpoint V2 at pin 26 of IC7301 | Testpoint V2 at pin 54 of IC7301 |
| | IC overview | IC overview | I²C overview |
| Diagram A1 (26) | B1 | Degassing coil | Degaussing coil |
| Diagram A4 (31) | A3 | To 0226 of SSB-connector [C8] | To 0226 of SSB-connector [C8] |
| | E1 | A5-31 | A5-30 |
| | G2 | A5-34 'AUDIO-C' | A5-34 'AUDIO-SURR' |
| | G5 | A5-51 'AUDIO-SURR' | A5-51 'AUDIO-C' |
| Diagram A5 (33) | G2 | A4-34 'AUDIO-C' | A4-34 'AUDIO-SURR' |
| | H2 | A4-51 'AUDIO-SURR' | A4-51 'AUDIO-C' |
| Diagram C2 (41) | C1 | C2-75 | C1-75 |
| Diagram C4 (44) | D7 | Internal circuit 7064 is wrong | See A10E-DPL manual page 29 |
| | F10 | To memory [C4] | To memory [C8] |
| | H1/H2 | To SSB connector [C7] | To SSB connector [C8] |
| Diagram C6 (45) | D11 | 'AUDIO-SURR' C6-56 | 'AUDIO-C' C6-56 |
| | D11 | 'AUDIO-C' C6-57 | 'AUDIO-SURR' C6-57 |
| Diagram C8 (47) | F2 | C6-56 'AUDIO-SURR' | C6-56 'AUDIO-C' |



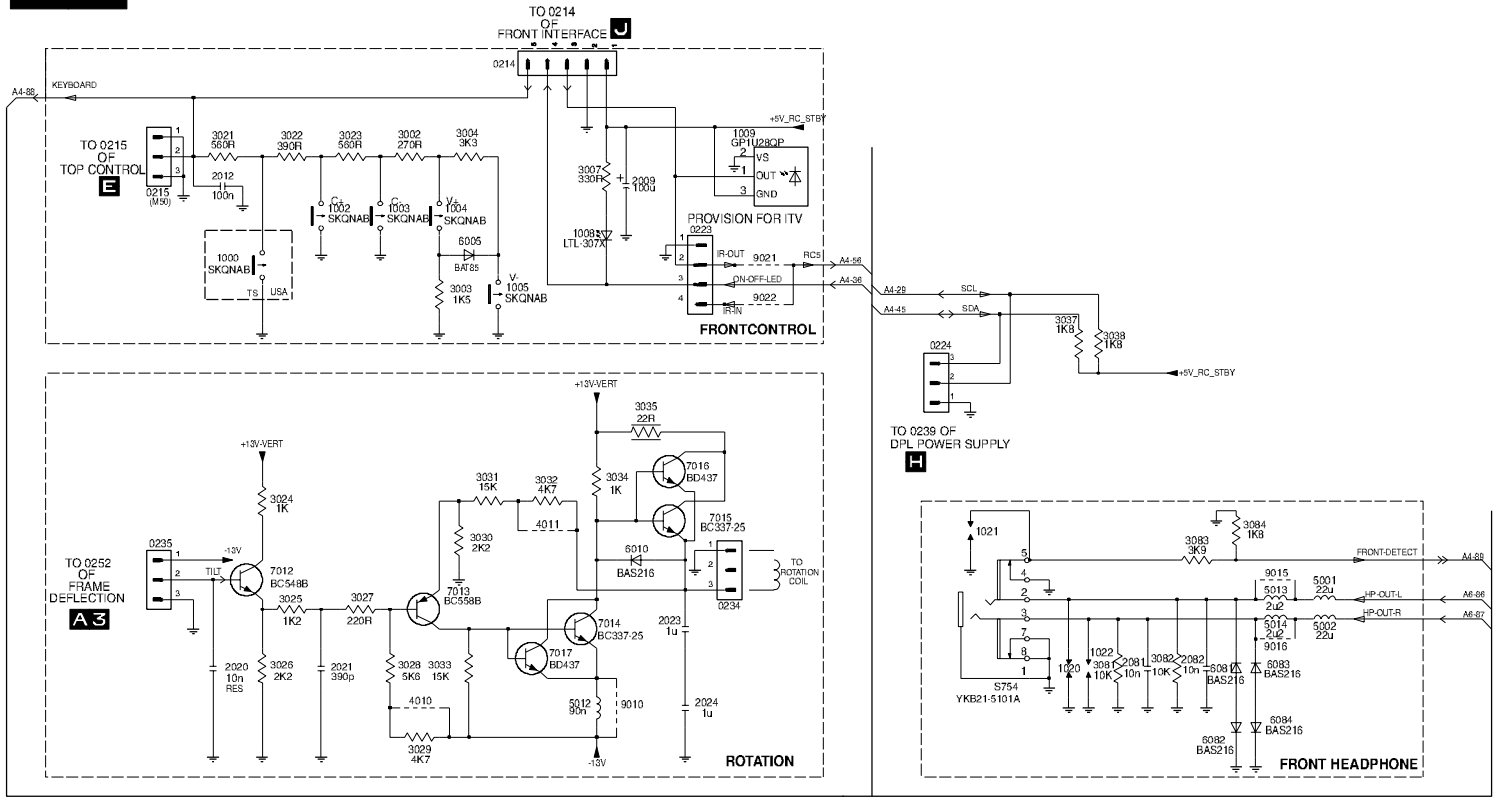
## SSP-Tuner




0201 D5
0218 B1
0226 A2
0229 F5
0239 D11
0242 A11
0272 E7
0273 D3
0276 B5
0280 B8
1225 B5
1230 F5
1231 F5
2248 C11
2261 D6
2262 D6
2263 G2
2264 G3
2265 D7
2266 E7
2267 D5
2268 D5
2271 D9
2276 D10
2280 C11
2281 C10
2282 C10
2284 B11
2286 C7
3220 C9
3255 A10
3256 A10
3257 A10
3263 C7
3264 D7
3267 D5
3268 C5
3271 C9
3272 D9
3273 E9
3274 D9
3276 D10
3277 D10
3278 B9
3280 C10
3281 C10
3282 B10
3283 E8
3284 C7
3285 C7
3286 F9
4218 B9
4226 C9
4261 C6
4262 C5
4263 D10
4264 D10
4267 C9
4268 C6
4271 B9
4272 B10
5261 B7
5262 A7
5263 D7
5264 C7
6265 D7
6266 A10
6271 C9
6272 B9
6273 E9
6274 B9
6275 B9
6276 B9
6278 B11
6279 D9
6280 C8
7273 D8
7276 D10
7277 A10
7280 C10
9261 F10
9262 F10

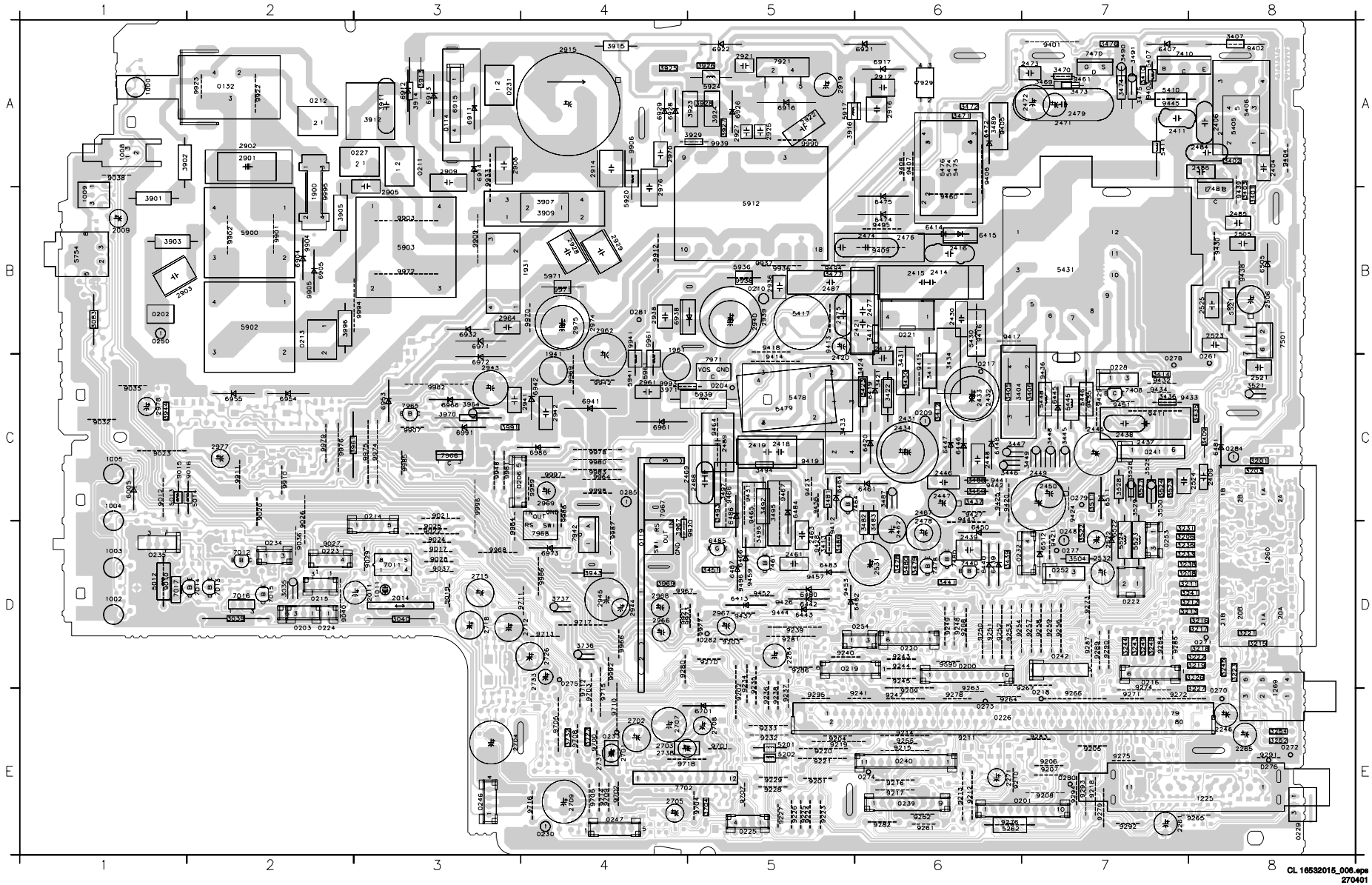
## Front Control / Rotation / Headphone

# A 7 FRONT CONTROL / ROTATION / HEADPHONE



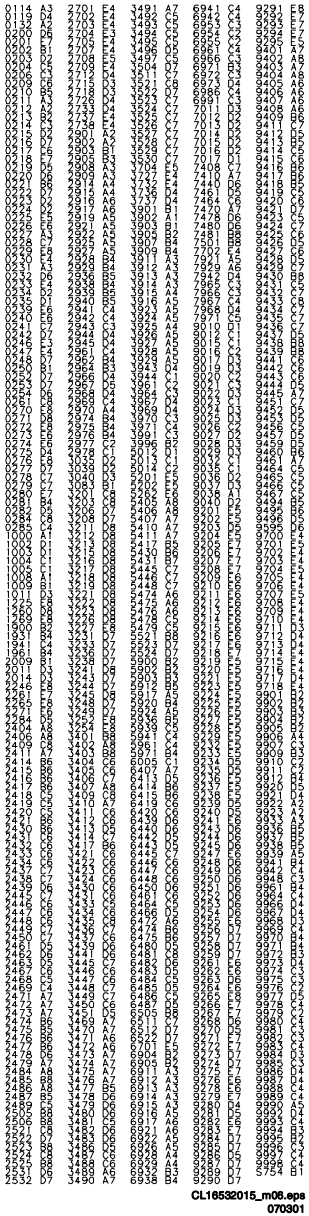

0214 B5
0215 B2
0223 C6
0224 D8
0234 E6
0235 E2
1000 C3
1002 C4
1003 C4
1004 C4
1005 C5
1008 C5
1009 B7
1020 F9
1021 E8
1022 F9
2009 B6
2012 B3
2020 F3
2021 F4
2023 F6
2024 F6
2081 F9
2082 F10
3002 B4
3003 C5
3004 B5
3007 B5
3021 B3
3022 B3
3023 B4
3024 E3
3025 E3
3026 F3
3027 E4
3028 F4
3029 F4
3030 E5
3031 D5
3032 E5
3033 F4
3034 D6
3035 D6
3037 C9
3038 C9
3081 F9
3082 F10
3083 E10
3084 E10
4010 F4
4011 E5
5001 E11
5002 F11
5012 F5
5013 E10
5014 F10
6005 C5
6010 E6
6081 F10
6082 F10
6083 F10
6084 F10
7012 E3
7013 E4
7014 F6
7015 E6
7016 D6
7017 F5
9010 F6
9015 E10
9016 F10
9021 C7
9022 C7
S754 F9

## Layout LSP (Top View)



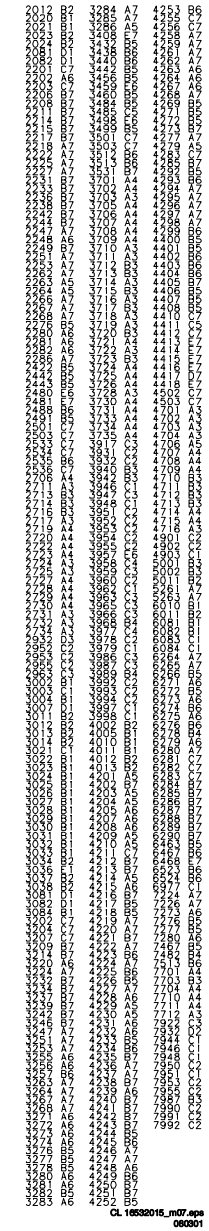
CL 16532015_006.eps
270401

## Mapping LSP (Top View)



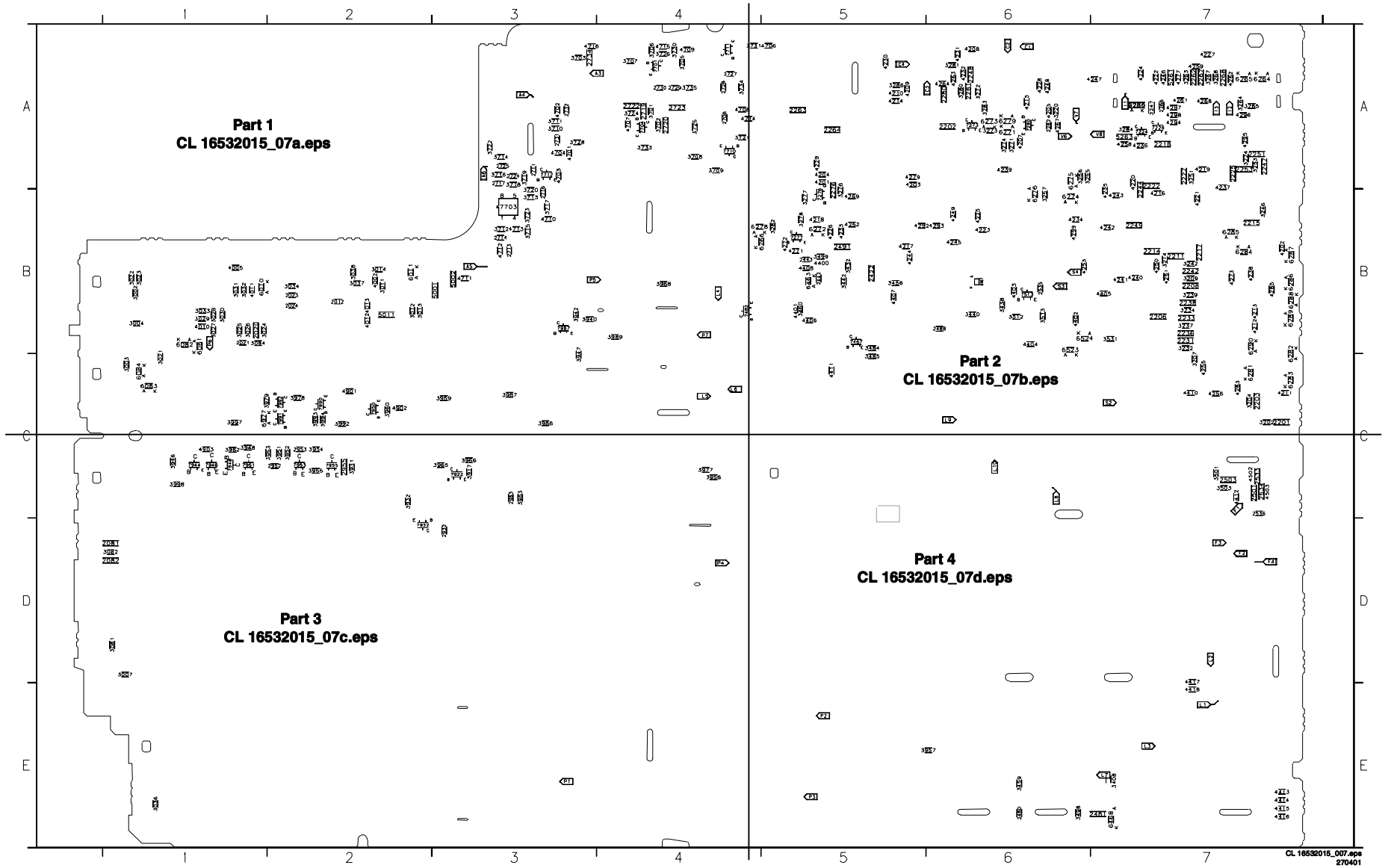
CL16532015_m06.eps
070301

## Mapping LSP (Bottom View)

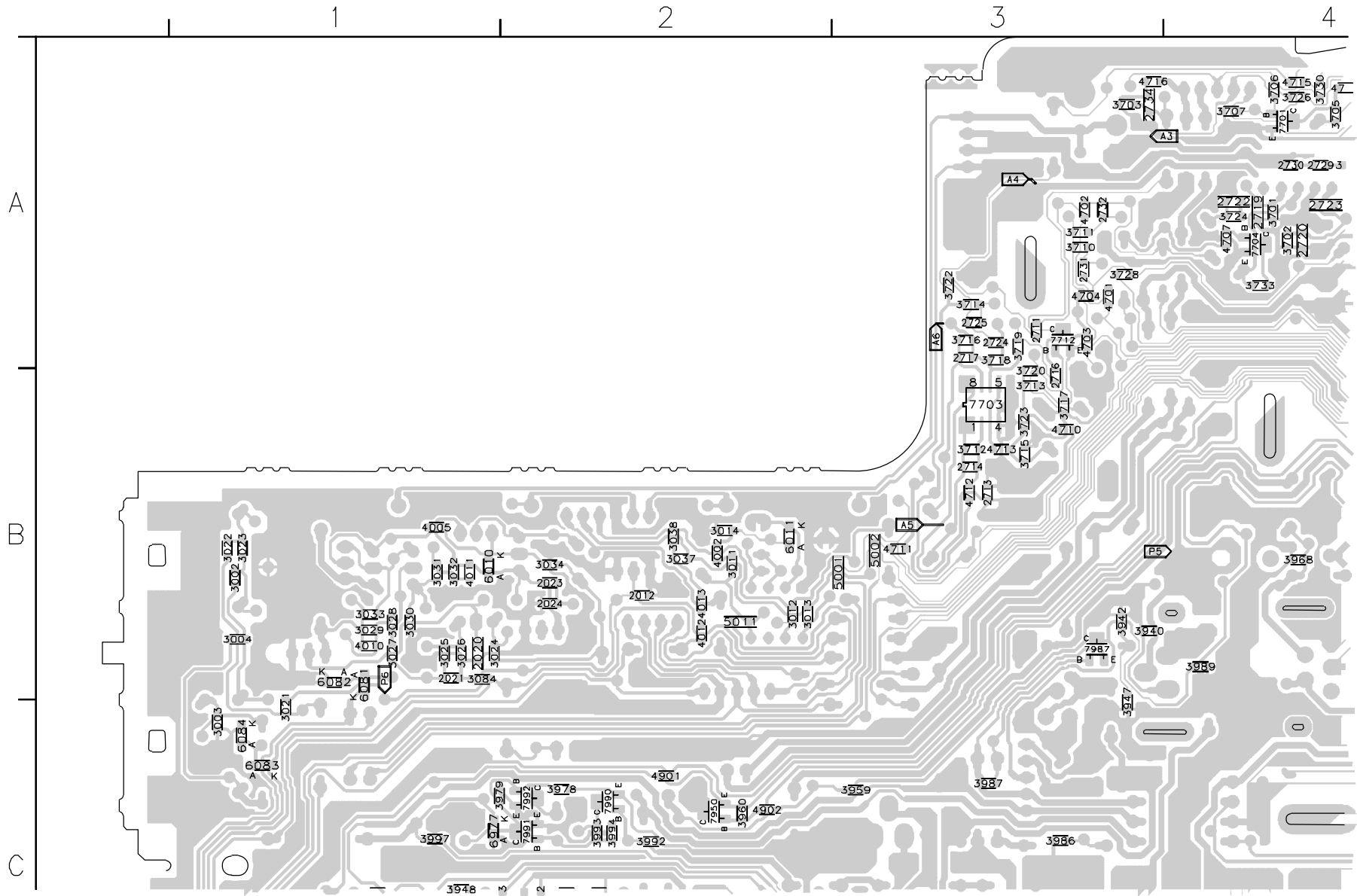


CL 16532015_m07.eps
060301

## Layout LSP (Overview Bottom View)

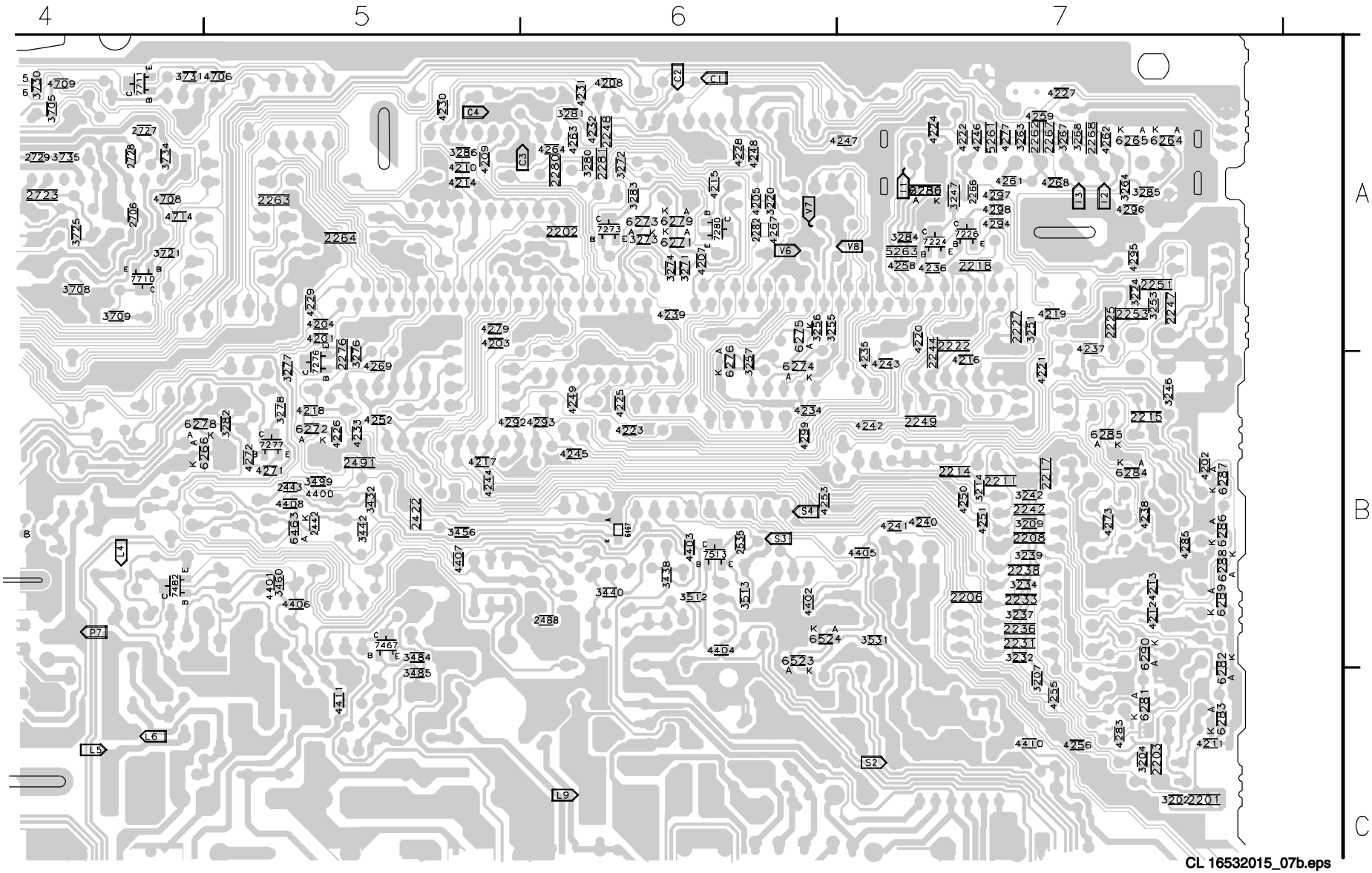


**Layout LSP (Part 1 Bottom View)**

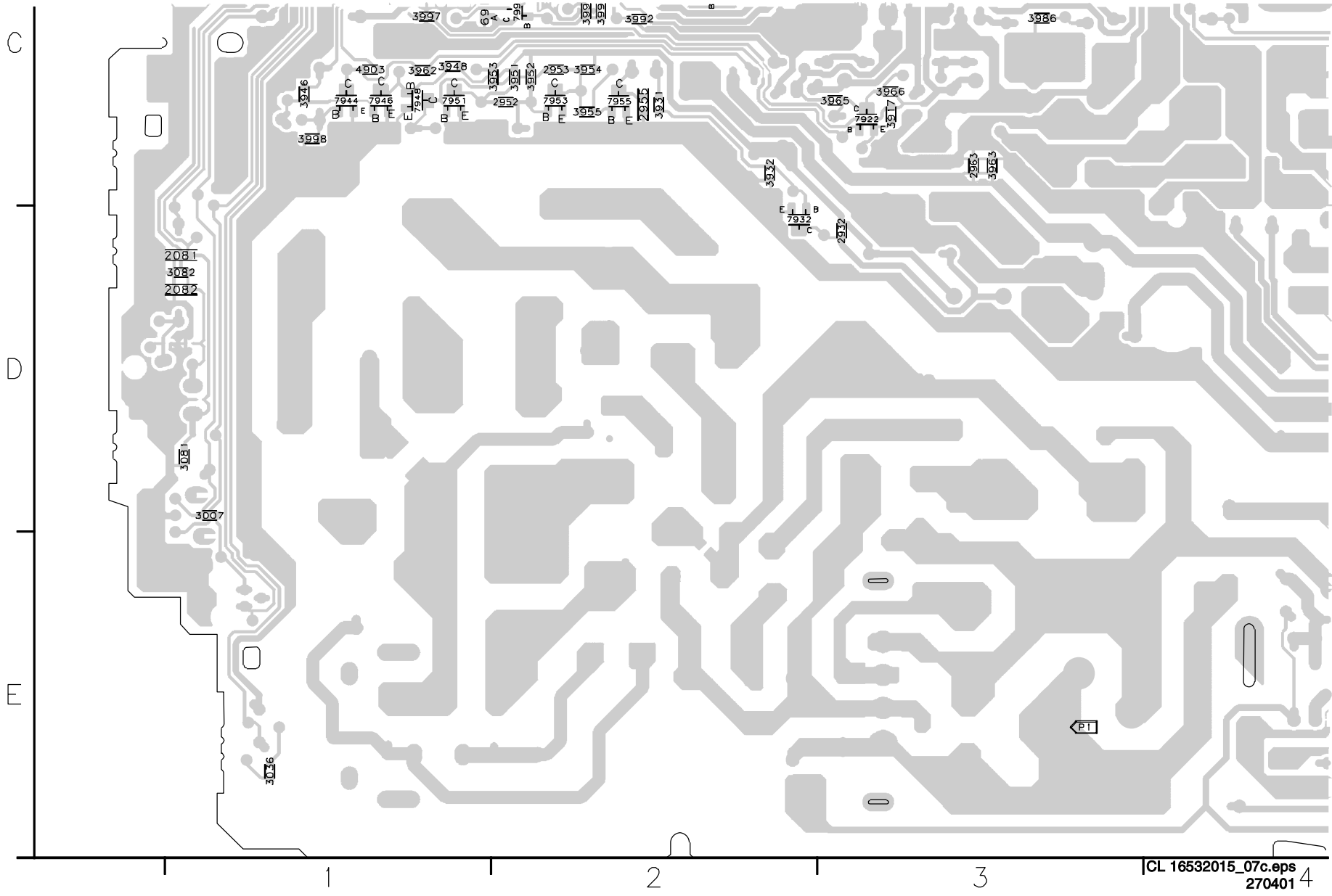



CL 16532015_07a.eps
270401

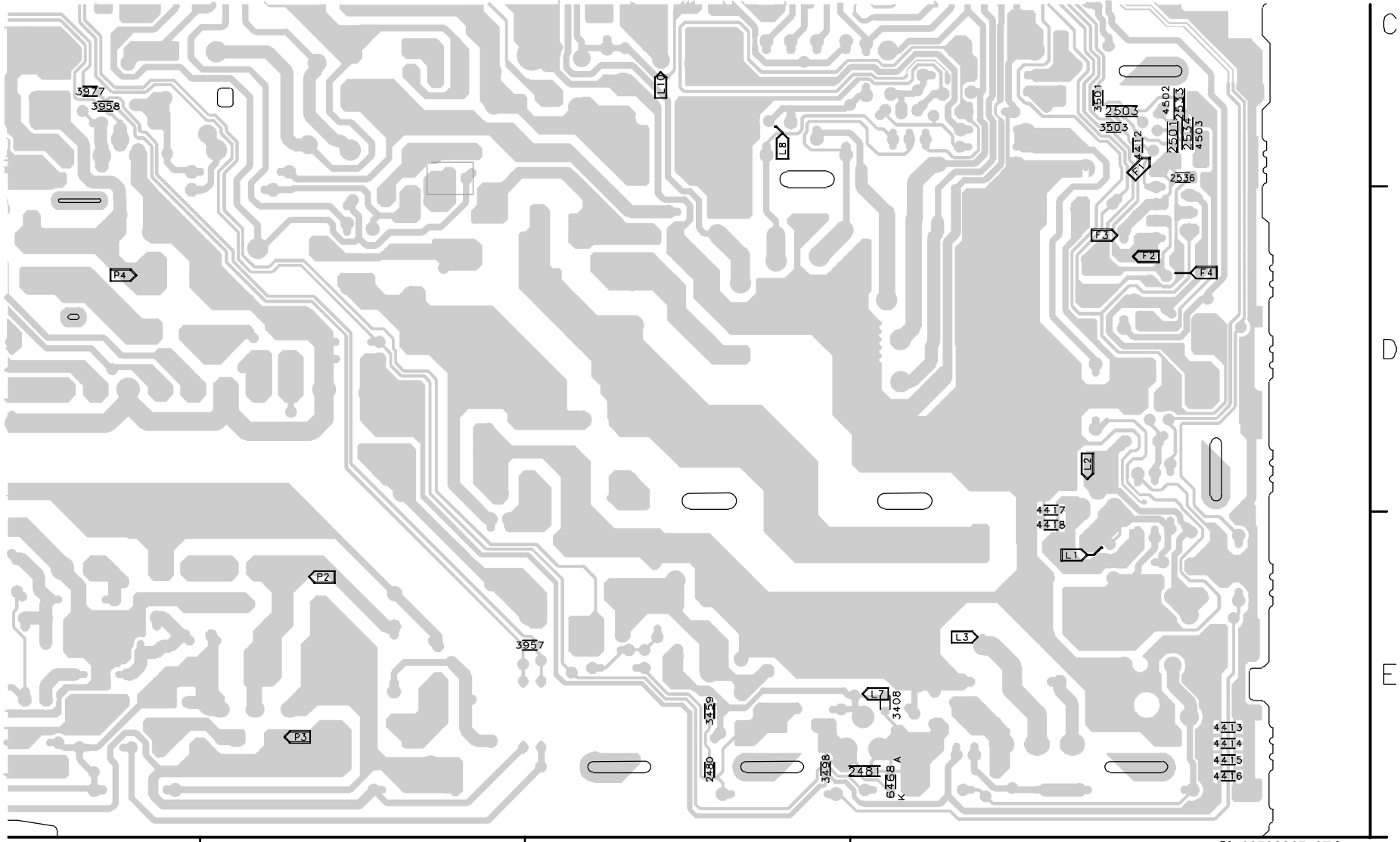
**Layout LSP (Part 2 Bottom View)**



**Layout LSP (Part 3 Bottom View)**

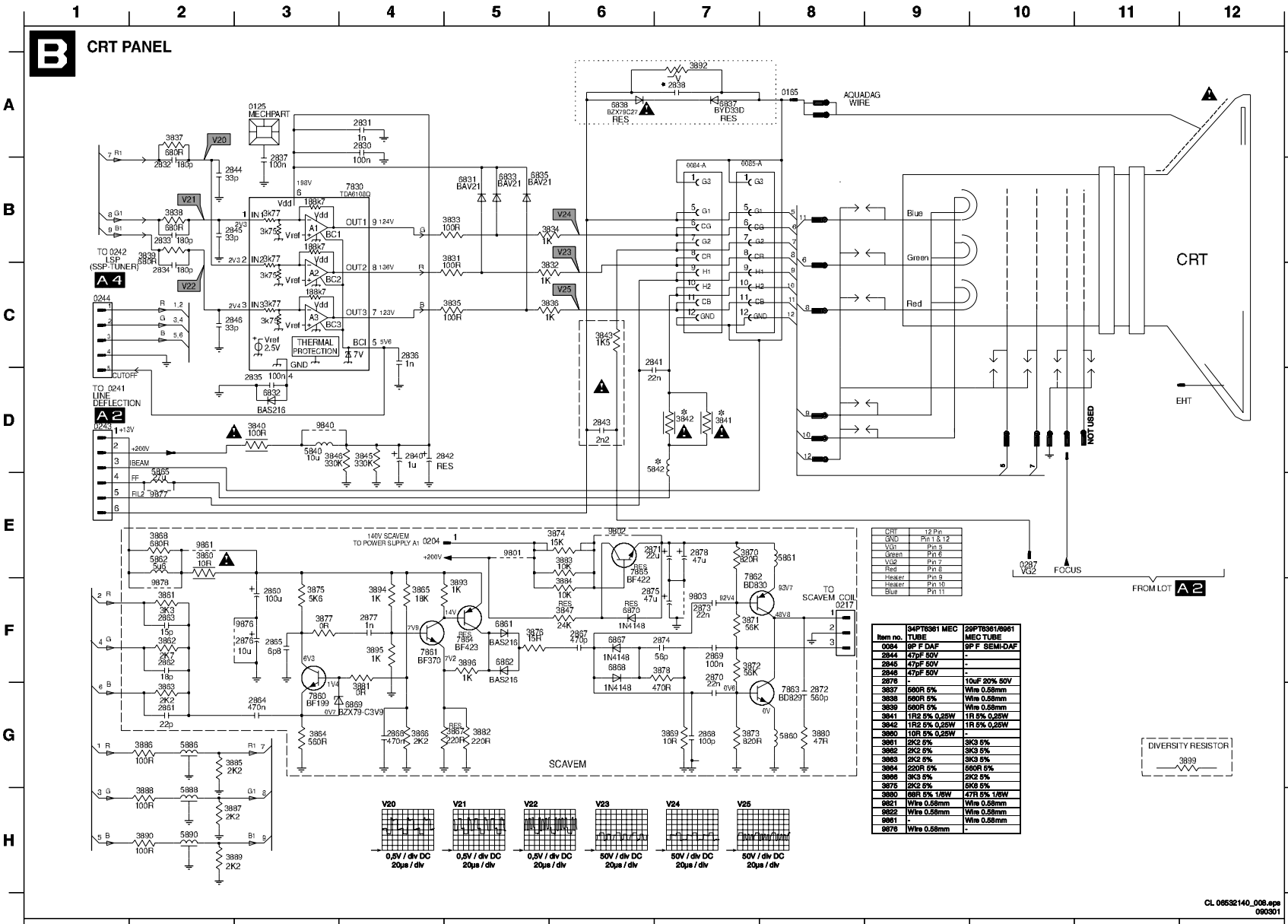


**Layout LSP (Part 4 Bottom View)**




CL 16532015_07d.eps
270401

## CRT Panel



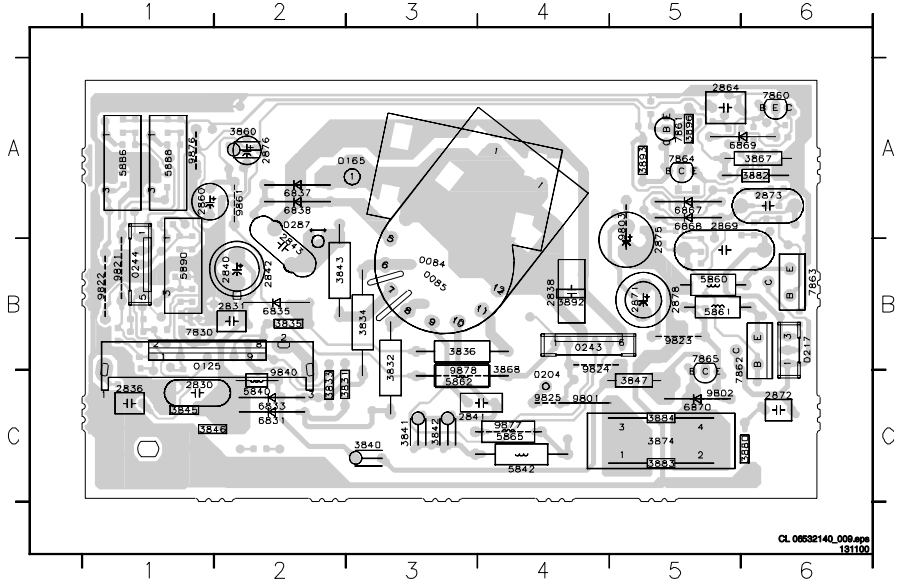

| CRT | 12 Pin |
|---|---|
| GND | Pin 1 & 12 |
| VG1 | Pin 5 |
| Green | Pin 6 |
| VG2 | Pin 7 |
| Red | Pin 8 |
| Heater | Pin 9 |
| Heater | Pin 10 |
| Blue | Pin 11 |

| Item no. | 34PT8361 MEC TUBE | 29PT8361/8661 MEC TUBE |
|---|---|---|
| 0084 | 9P F DAF | 9P F SEMI-DAF |
| 2844 | 47pF 50V | - |
| 2845 | 47pF 50V | - |
| 2846 | 47pF 50V | - |
| 2876 | - | 10uF 20% 50V |
| 3837 | 560R 5% | Wire 0.58mm |
| 3838 | 560R 5% | Wire 0.58mm |
| 3839 | 560R 5% | Wire 0.58mm |
| 3841 | 1R2 5% 0,25W | 1R 5% 0,25W |
| 3842 | 1R2 5% 0,25W | 1R 5% 0,25W |
| 3860 | 10R 5% 0,25W | - |
| 3861 | 2K2 5% | 3K3 5% |
| 3862 | 2K2 5% | 3K3 5% |
| 3863 | 2K2 5% | 3K3 5% |
| 3864 | 220R 5% | 560R 5% |
| 3866 | 3K3 5% | 2K2 5% |
| 3875 | 2K2 5% | 5K6 5% |
| 3880 | 68R 5% 1/6W | 47R 5% 1/6W |
| 9821 | Wire 0.58mm | Wire 0.58mm |
| 9822 | Wire 0.58mm | Wire 0.58mm |
| 9861 | - | Wire 0.58mm |
| 9876 | Wire 0.58mm | - |

0084-A B7 5865 E2
0085-A B8 5886 G2
0125 A3 5888 H2
0165 A8 5890 H2
0204 E4 6831 B5
0217 F8 6832 D3
0243 D1 6833 B5
0244 C1 6835 B5
0287 E10 6837 A7
2830 A4 6838 A6
2831 A4 6861 F5
2832 B2 6862 F5
2833 B2 6867 F6
2834 C2 6868 F6
2835 D3 6869 G4
2836 C4 6870 F6
2837 B3 7830 B4
2838 A7 7860 G3
2840 D4 7861 F4
2841 C6 7862 E7
2842 D5 7863 G8
2843 D6 7864 F5
2844 B2 7865 E6
2845 B2 9801 E5
2846 C2 9802 E6
2860 F3 9803 F7
2861 G2 9840 D3
2862 F2 9861 E2
2863 F2 9876 F3
2864 G3 9877 E2
2865 F3 9878 F2
2866 G4
2867 F6
2868 G7
2869 F7
2870 F7
2871 E6
2872 G8
2873 F7
2874 F7
2875 F6
2876 F3
2877 F4
2878 E7
3831 B5
3832 C6
3833 B5
3834 B6
3835 C5
3836 C6
3837 A2
3838 B2
3839 B2
3840 D3
3841 D7
3842 D7
3843 C6
3845 D4
3846 D3
3847 F6
3860 E2
3861 F2
3862 F2
3863 G2
3864 G3
3865 F4
3866 G4
3867 G5
3868 E2
3869 G7
3870 E7
3871 F7
3872 F7
3873 G7
3874 E6
3875 F3
3876 F5
3877 F3
3878 F7
3880 G8
3881 G4
3882 G5
3883 E6
3884 F6
3885 G2
3886 G2
3887 H2
3888 H2
3889 H2
3890 H2
3892 A7
3893 F5
3894 F4
3895 F4
3896 F5
3899 G12
5840 D3
5842 D7
5860 G8
5861 E8
5862 E2

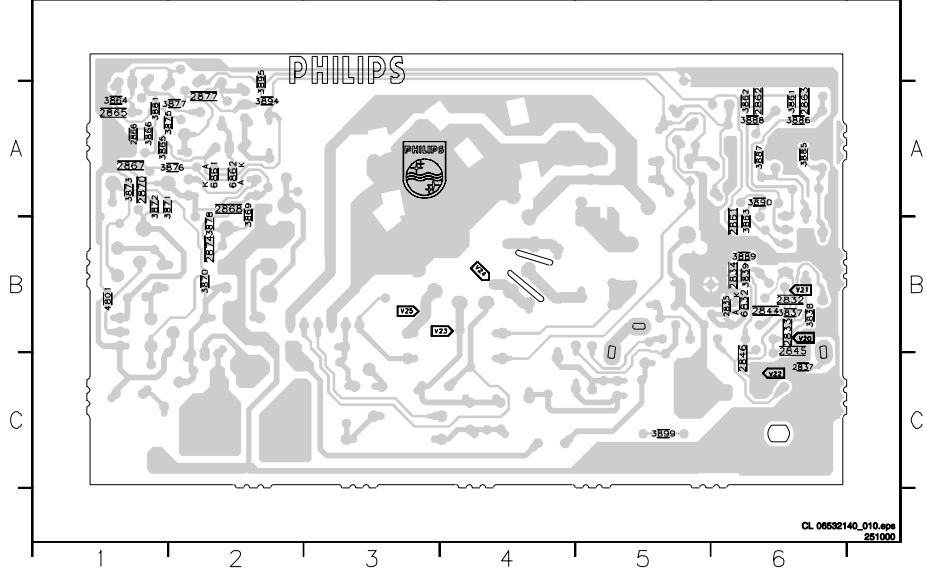
## Layout CRT Panel (Top View)

0084 B3 0287 A2 2843 B2 2876 A2 3840 C3 3867 A6 3893 A5 5886 A1 6867 A5 7863 B6 9823 B5
0085 B3 2830 C1 2860 A1 2878 B5 3841 C3 3868 B4 3896 A5 5888 A1 6868 A5 7864 A5 9824 B4
0125 B1 2831 B2 2864 A6 3831 C2 3842 C3 3874 C5 5840 C2 5890 B1 6869 A6 7865 B5 9825 C4
0165 A1 2836 C1 2869 A5 3832 B2 3843 B2 3880 C6 5842 C4 6831 C2 6870 C5 7867 C5 9840 C2
0204 C4 2838 B4 2871 B5 3833 C2 3845 C1 3882 A6 5860 B5 6833 C2 7830 B1 9801 C5 9861 A2
0217 B6 2840 B2 2872 C6 3834 B3 3846 C1 3883 C5 5861 B5 6835 B2 7860 A6 9803 A5 9876 A1
0243 B4 2841 A4 2873 A6 3835 B3 3847 A2 3884 A2 5862 C2 6837 A5 7861 A5 9821 B1 9877 C4
0244 B1 2842 B2 2875 B5 3836 B3 3860 A2 3892 B3 5865 C4 6838 A2 7862 C5 9822 B1 9878 C3




## Layout CRT Panel (Bottom View)

2832 B6 2844 B6 2863 A6 2870 A1 3839 B6 3865 A1 3872 A1 3878 B2 3888 A6 3899 C5
2833 B6 2845 B6 2865 A1 2874 B2 3861 A6 3866 A1 3873 A1 3881 A1 3889 B6 4801 B1
2834 B6 2846 C6 2866 A1 2877 A2 3862 A6 3869 A2 3875 A1 3885 A6 3890 A6 6832 B6
2835 B6 2861 B6 2867 A1 3837 B6 3863 B6 3870 B2 3876 A2 3886 A6 3894 A2 6861 A2
2837 C6 2862 A6 2868 A2 3838 B6 3864 A1 3871 A1 3877 A2 3887 A6 3895 A2 6862 A2



# Alignments

**Note:** The Service Default Mode (SDM) and Service Alignment Mode (SAM) are described in chapter 5.

## General Alignment conditions

All electrical adjustments should be performed under the following conditions:

- Supply voltage: 220 V (± 10 %); 50 Hz (± 5 %).
- Warm-up time: ≈ 20 minutes.
- The voltages and oscillograms are measured in relation to the tuner earth (with exception of the voltages on the primary side of the power supply). Never use the cooling fins / plates as ground.
- Test probe: Ri > 10 MΩ; Ci < 2.5 pF.
- Use an **isolated** trimmer / screwdriver for the alignments.

## Electrical Alignments

### Vg2

***Rough Method***

Using a pattern-generator displaying a black pattern.

1. Set CONTRAST to 0.
2. Set BRIGHTNESS to minimum in a black room (OSD still visible). Select any of the AV-sources.
3. Go to the SAM.
4. Set VSD to ON.
5. Adjust the Vg2 potmeter of the LOT until the horizontal line is just visible.
6. Set VSD to OFF.
7. Exit SAM.

***Accurate Method***

1. Activate the SAM-menu (see A10A manual chapter 5.2.2). Go to the sub-menu 'WHITE TONE' and adjust the value of NORMAL RED, GREEN and BLUE to 40 (or 42 for 29" RF).
2. Go, via the MENU key, temporarely to the normal user menu and set the values of BRIGHTNESS and CONTRAST to minimum (OSD just visible).
3. Return to the SAM-menu via the MENU-key. Disable the black current loop by changing 'AKB' to 'OFF'.
4. Connect the RF-output of the pattern generator to the antenna-input. Test pattern is a 'black' pattern (blank screen on CRT **without** any OSD info).
   Set the time base of the oscilloscope to 0.5 ms with external triggering on the vertical pulse. Measure the black level pulse during the vertical flyback at the RGB cathodes of the CRT.

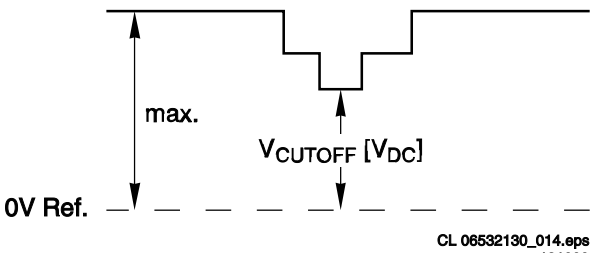



**Figure 1**

Adjust $V_{cutoff}$ of the highest of the three guns (with the Vg2 potmeter of the LOT) to:
- 160 $V_{DC}$ for 24", 25" and 28" BLD WS sets,
- 165 $V_{DC}$ for 28"/32" BLSW, 28" RFW and 29" RF sets.

### Focus

1. Tune the set to a circle or crosshatch test pattern (use an external video pattern generator).
2. Adjust the Focus potmeter until the vertical lines at 2/3 from east and west, at the height of the centre line, are of minimum width without visible haze.

## Alignments And Settings In The SAM.

**General**

With the software alignments of the Service Alignment Mode the Tuner, White tone, Geometry, Sound and Smart Settings can be aligned. Put the set in the SAM mode. The SAM menu will now appear on the screen (see A10A manual chapter 5).
Menu navigation is done with the 'CURSOR UP, DOWN, LEFT or RIGHT' keys of the RC-handset.

**Tuner (Large Signal Panel And Double Window)**

***IF PLL OFFSET And AFC WINDOW***

No adjustments needed for these alignments. The default values for these options are:
- IF PLL OFFSET: 32
- AFC WINDOW: 100 kHz

***AGC***

Set an external pattern generator (e.g. PM5418) to a grey scale video signal and connect it to the aerial input with RF signal. Set the signal amplitude to at least 1 mV and to a frequency of 475.25 MHz for PAL.

1. Activate the SAM-menu. Go to the sub-menu TUNER, select the sub-menu option AFC WINDOW and adjust the value to 100kHz.
2. Select the AGC sub-menu.
3. Connect a DC multi-meter to pin 1 of the tuner (1225).
4. Adjust the AGC until the voltage at pin 1 of the tuner is within 2.5 V < AGC takeover voltage < 3.8 V.
5. The value can be incremented or decremented by pressing the RIGHT/LEFT cursor keys on the RC.
6. Switch the set to standby.

**White Tone**

In the WHITE TONE sub menu, the colour temperature values can be changed.
The colour temperature mode (NORMAL, DELTA COOL, DELTA WARM) and the colour (R, G, B) can be selected with the UP/DOWN cursor keys. The mode or value can be changed with the RIGHT/ LEFT cursor keys.
First set the values for the NORMAL colour temperature. Then set the offset values for the DELTA COOL and DELTA WARM modes.
Following default values can be used:

- **NORMAL:**
  RED = 32,
  GREEN = 32
  BLUE = 32.
- **DELTA COOL:**
  RED = 0,
  GREEN = 2
  BLUE = 9.
- **DELTA WARM:**
  RED = 0,
  GREEN = -3
  BLUE = -11.
- CATHODE DR = 7.

**Geometry**

The geometry alignments menu contains several items to align the set, in order to obtain a correct picture geometry.
In widescreen sets, the 'SUPER WIDE' menu is available for separate alignments of the superwide (panorama) mode.

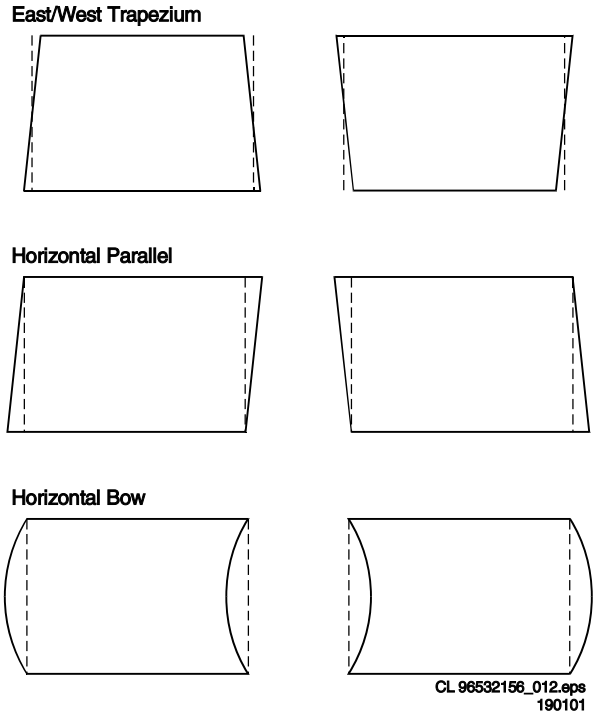



**Figure 2**

**Initial Set-Up**

1. Connect an external video pattern generator (PAL-475.25 MHz) to the aerial input of the TV-set with a crosshatch test pattern.
2. Set SMART PICTURE to NATURAL.
3. Activate the SAM-menu and select GEOMETRY.
4. Set VER.SCOR to value:
   - '8' for 28" WS picture tubes,
   - '13' for 25", 28", 29", 32" and 34" 4:3 picture tubes,
   - '23' for 29" SF picture tubes.
5. Set VER.ZOOM to value:
   - 25 (for widescreens; set in SUPER WIDE mode to 35).

**Alignment Sequence**

- For all sets:
  1. Set SERV.BLK to ON
  2. Adjust VER.SLOPE
  3. Set SERV.BLK to OFF
  4. Adjust VER.AMPL and VER.SHIFT
  5. Adjust EW.WIDTH and HOR.SHIFT
  6. Adjust EW.PARA
  7. Adjust EW.UCORN and EW.LCORN
  8. Adjust EW.TRAP
  9. Adjust HOR.BOW and HOR.PARALLEL

- For widescreen sets only (go to super wide mode):
  1. Set SERV.BLK to ON
  2. Adjust VER.SLOPE
  3. Set SERV.BLK to OFF
  4. Adjust EW.WIDTH and HOR.SHIFT
  5. Adjust EW.PARA
  6. Adjust EW.UCORN and EW.LCORN
  7. Adjust EW.TRAP
  8. Adjust HOR.BOW and HOR.PARALLEL

Explanation of terminology

– *Service blanking (SERV. BLK)*
  Switch the blanking of the lower half of the screen ON/OFF (to be used in combination with the vertical slope alignment).
– *Vertical slope (VER. SLOPE)*
  Align the vertical centre of the picture to the vertical centre of the CRT.This is the first alignment to be performed of the vertical alignments. For an easy alignment set SERV.BLK to ON.
– *Vertical S-correction (VER. SCOR)*
  Align the vertical linearity, meaning that vertical intervals of a grid-pattern must be equal over the entire height.
– *Vertical amplitude (VER. AMPL)*
  Align the picture height so that the complete test pattern is visible. Note that other vertical alignments are not compensated.
– *Vertical shift (VER. SHIFT)*
  Align the vertical centering so that the test pattern is located vertically in the middle. Repeat the 'vertical amplitude' alignment if necessary.
– *Horizontal shift (HOR. SHIFT)*
  Align the horizontal centre of the picture to the horizontal centre of the CRT.
– *Horizontal parallelogram (HOR. PARALLEL)*
  Align straight vertical lines in the top and the bottom; vertical rotation around the centre.
– *East West width (EW. WIDTH)*
  Align the picture width until the complete test pattern is visible.
– *East West Upper Corner (EW. UCORN)*
  Align straight vertical lines in the upper corners of the screen.
– *East West Lower Corner (EW. LCORN)*
  Align straight vertical lines in the lower corners of the screen.
– *East West Trapezium (EW. TRAP)*
  Align straight vertical lines in the middle of the screen.
– *East West parabola (EW. PARA)*
  Align straight vertical lines at the sides of the screen.
– *Horizontal bow (HOR. BOW)*
  Align straight horizontal lines in the top and the bottom; horizontal rotation around the centre.

When a NTSC signal is used on one of the **EXTERNAL** inputs, the following additional alignments can be performed to correct the picture (descriptions above):

1. Horizontal width 60 Hz (H60. WIDTH)
2. Horizontal parallelogram 60Hz (H60. PARA)
3. Horizontal shift 60 Hz (H60. SHIFT)
4. Vertical amplitude 60 Hz (V60. AMPL)

**Sound**

There are no adjustments needed for SOUND.
Default values:

- NIC-FMAM = 250
- 2CS-FM = 40
- PS-FM = 27
- PS-NIC-BGDK = 58
- PS-NIC-I = 127
- PS-NIC-L = 58
- DEVIATION = OFF

**Smart Settings**

| SMART SETTINGS DEFAULT VALUES | | |
|---|---|---|
| **CRT SIZE ->** | **< 32"** | **32"** |
| **RICH BGT** | 35 | 42 |
| **RICH COL** | 35 | 61 |
| **RICH CON** | 55 | 84 |
| **RICH SHP** | 55 | 55 |
| **RICH HUE** | 50 | 50 |
| **NATURAL BGT** | 30 | 43 |
| **NATURAL COL** | 21 | 40 |
| **NATURAL CON** | 49 | 65 |
| **NATURAL SHP** | 40 | 40 |
| **NATURAL HUE** | 50 | 50 |
| **SOFT BGT** | 27 | 42 |
| **SOFT COL** | 22 | 42 |
| **SOFT CON** | 32 | 38 |
| **SOFT SHP** | 20 | 20 |
| **SOFT HUE** | 50 | 50 |
| **MULTI BGT** | 27 | 39 |
| **MULTI COL** | 22 | 38 |
| **MULTI CON** | 32 | 55 |
| **MULTI SHP** | 20 | 20 |
| **MULTI HUE** | 50 | 50 |

## Options

**Introduction**

Options are used to control the presence/absence of certain features and hardware. The correct option values can be found on a sticker on the picture tube (after removal of the rear cover).

There are two ways to change the option settings:

1. Change a single option
   Select an option with the MENU UP/DOWN keys and change its setting with the MENU LEFT/RIGHT keys.
2. Change multiple options via Option Bytes
   When you change the option bytes directly, it is possible to set all options very fast. An option byte represents a number of different options (see tables below). All options are controlled via 8 option bytes.
   Select the option byte (OB1..OB8). with the MENU UP/DOWN keys and key in the new value.

**Note:**

Changes in the option byte settings are saved automatically after leaving this sub-menu.
Some changes will only take affect after the set has been switched OFF and ON with the mains switch (cold start).

**List Of Options**

These option bits can be set ON (= 1) or OFF (= 0). If an option is set ON, it represents a certain (decimal) value.
To calculate the Option Byte value (OB), add the values of the 8 option bits:

An option byte value is calculated in the following way:
Value 'option bit 1' x 1 =
Value 'option bit 2' x 2 =
Value 'option bit 3' x 4 =
Value 'option bit 4' x 8 =
Value 'option bit 5' x 16 =
Value 'option bit 6' x 32 =
Value 'option bit 7' x 64 =
Value 'option bit 8' x 128 =
========== +
Total value 'option byte' =
On the next page you'll find the option lists for the 2 software versions, and an explanation table.

| SW: A10ET1-x.y | Bit 8 (128) | Bit 7 (64) | Bit 6 (32) | Bit 5 (16) | Bit 4 (8) | Bit 3 (4) | Bit 2 (2) | Bit 1 (1) |
|---|---|---|---|---|---|---|---|---|
| OB1 | SBNP | C169 | E149 | HOSP | SMCK | AV3 | WSCR | CBFL |
| OB2 | IPIX | IPMU | NTSC | PITN | ACI | ATS | PLST | VMOD |
| OB3 | SOSD | FAPG | UKPNP | DNRM | VMUT | AAVL | ROTI | SNIC |
| OB4 | TMWIN | NPRG | WSSB | INCF | Res. | Res. | Res. | Res. |
| OB5 | Res. | Res. | Res. | Res. | Res. | Res. | Res. | Res. |
| OB6 | Res. | Res. | Res. | Res. | Res. | Res. | Res. | Res. |
| OB7 | Res. | Res. | Res. | Res. | Res. | Res. | Res. | Res. |
| OB8 | Res. | Res. | Res. | Res. | Res. | Res. | SYSTEM | SYSTEM |

| SW: A10EP1-x.y | Bit 8 (128) | Bit 7 (64) | Bit 6 (32) | Bit 5 (16) | Bit 4 (8) | Bit 3 (4) | Bit 2 (2) | Bit 1 (1) |
|---|---|---|---|---|---|---|---|---|
| OB1 | SBNP | C169 | E149 | HOSP | SMCK | AV3 | WSCR | CBFL |
| OB2 | IPIX | IPMU | NTSC | VDBY | EPG | P50 | PITN | ACI |
| OB3 | ATS | PLST | VMOD | SOSD | FAPG | UKPNP | DTXT | DNRM |
| OB4 | VMUT | AAVL | ROTI | SNIC | TMWIN | NPRG | WSSB | INCF |
| OB5 | APC | Res. | Res. | Res. | Res. | Res. | Res. | Res. |
| OB6 | Res. | Res. | Res. | Res. | Res. | Res. | Res. | Res. |
| OB7 | Res. | Res. | Res. | Res. | Res. | Res. | Res. | Res. |
| OB8 | Res. | Res. | Res. | Res. | Res. | Res. | SYSTEM | SYSTEM |

| Option abbreviation | Description |
|---|---|
| AAVL | Automatic Volume Level |
| ACI | Automatic Channel Installation |
| APC | Auto Picture Control |
| ASBY | Auto switch to STDBY after 2 hrs. |
| ATS | Automatic Tuning System |
| AUSB | Auto switch to STDBY after 2 hrs. |
| AV3 | External 3 (Side I/O) |
| BLMU | Blue Mute |
| C169 | Picture setting for Compress 16:9 |
| CBFL | Comb Filter |
| CCAP | Closed Captioning |
| CHLK | Child Lock |
| CHNA | China |
| CVI | Ext. source selection for DW/PIP |
| DNRM | DNR Noise Reduction |
| DTXT | Dual page Teletext available |
| E149 | Picture setting for Expand 14:9 |
| EPG | Electronic Program Guide |
| FAPG | Favorite Page |
| HOSP | Hospitality mode |
| INCF | Internal Comb Filter |
| IPIX | Incredible Picture |
| IPMU | Incredible Picture via menu |
| ISUR | Incredible Surround |
| MLNK | M-Link |
| NPRG | Max. number of programs (80/100) |
| NTSC | NTSC playback |
| NVM | Power down circuit to protect NVM |
| P50 | Easy Link |
| PIPC | PIP Control |
| PIPS | PIP Surf |
| PIPT | PIP Tuner |

| Option abbreviation | Description |
|---|---|
| PITN | Philips Tuner present |
| PLST | Program List |
| ROTI | Rotation |
| SBNP | Auto Standby with no picture |
| SMCK | Smart clock |
| SNIC | Sound IC 3451 |
| SOSD | Smart OSD |
| SURF | Surf |
| SYSTEM | EW=West-, EE=East-, EM=Mid-EU |
| TIME | Timer |
| TMWIN | Time Window |
| UKPNP | UK plug and play |
| VDBY | Virtual Dolby |
| VMUT | Video Mute |
| VMOD | Virgin mode |
| VSLC | Vertical Slicing |
| W169 | Double Window 16:9 |
| W4X3 | Double Window 4:3 |
| WSCR | Wide screen |
| WSSB | Wide screen signalling bit |

# Spare Parts List

## A10E LSP

### Various

| | | |
|---|---|---|
| 0084⚠ | 2422 500 80052 | Con 9P |
| 0084⚠ | 2422 500 80061 | Con 9P |
| 0127⚠ | 3122 358 72141 | Fuse holder |
| 0132⚠ | 4822 276 14024 | Mains switch |
| 0137 | 4822 492 70789 | Transistor fixation |
| 0138 | 4822 492 70789 | Transistor fixation |
| 0139 | 4822 492 70788 | IC fixation |
| 0140 | 4822 492 70789 | Transistor fixation |
| 0141 | 4822 492 70788 | IC fixation |
| 0144 | 4822 492 70789 | Transistor fixation |
| 0188 | 3122 224 04242 | Heatsink clamp bracket |
| 0189 | 3139 124 33361 | SSB Bracket |
| 0211⚠ | 4822 267 10774 | Con 2P |
| 0212⚠ | 4822 265 20723 | Con 2P |
| 0212⚠ | 4822 267 10775 | Con 2P |
| 0214 | 4822 267 10734 | Con 5P |
| 0215 | 2422 025 16382 | Con 3P |
| 0215 | 4822 267 10735 | Con 3P |
| 0217 | 4822 267 10735 | Con 3P |
| 0221⚠ | 4822 267 10966 | Con 2P |
| 0222 | 2422 025 10646 | Con 2P |
| 0226 | 2422 025 16599 | Con 80P |
| 0229⚠ | 2422 025 16601 | Con 3P |
| 0232 | 4822 267 10565 | Con 4P |
| 0234 | 4822 267 10735 | Con 3P |
| 0235 | 2422 025 04851 | Con 3P |
| 0238 | 4822 267 10735 | Con 3P |
| 0240 | 2422 025 12485 | Con 11P |
| 0241 | 2422 025 04854 | Con 6P |
| 0242 | 4822 265 30735 | Con 5P |
| 0243 | 2422 025 04854 | Con 6P |
| 0244 | 4822 265 30735 | Con 5P |
| 0246 | 4822 267 10565 | Con 4P |
| 0247 | 4822 267 10734 | Con 5P |
| 0252 | 2422 025 04851 | Con 3P |
| 0253 | 4822 267 10735 | Con 3P |
| 0254 | 4822 267 10735 | Con 3P |
| 1002 | 4822 276 13775 | Switch |
| 1003 | 4822 276 13775 | Switch |
| 1004 | 4822 276 13775 | Switch |
| 1005 | 4822 276 13775 | Switch |
| 1008⚠ | 4822 130 10859 | TLDR5400 |
| 1009 | 9322 127 54667 | IR Receiver TSOP1836UH1 |
| 1225 | 4822 210 10848 | UV1316/A I U-2 |
| 1225 | 4822 210 10853 | TEDE9-004A |
| 1260 | 2422 025 16745 | Con 42P |
| 1269 | 4822 267 10982 | Con 2P |
| 1754 | 4822 267 31014 | Headphone socket |
| 1900⚠ | 2422 086 10905 | Fuse 4A |
| 1931 | 4822 280 10367 | Con 1P |
| 1941⚠ | 4822 071 51602 | Fuse 1.6A |
| 1961⚠ | 4822 071 51602 | Fuse 1.6A |

⊣⊢

| | | |
|---|---|---|
| 2009 | 4822 124 40207 | 100µF 20% 25V |
| 2012 | 4822 126 14585 | 100nF 10% 50V |
| 2020 | 4822 122 33177 | 10nF 20% 50V |
| 2021 | 4822 122 33172 | 390pF 5% 50V |
| 2023 | 4822 126 14043 | 1µF 20% 16V |
| 2024 | 4822 126 14043 | 1µF 20% 16V |
| 2081 | 4822 122 33177 | 10nF 20% 50V |
| 2082 | 4822 122 33177 | 10nF 20% 50V |
| 2201 | 5322 122 31863 | 63V 330pF 5% |
| 2202 | 4822 126 13692 | 47pF 1% 63V |
| 2203 | 5322 122 31863 | 63V 330pF 5% |
| 2206 | 5322 122 31863 | 63V 330pF 5% |
| 2208 | 5322 122 31863 | 63V 330pF 5% |
| 2211 | 5322 122 32658 | 22pF 5% 50V |
| 2214 | 5322 122 31863 | 63V 330pF 5% |
| 2215 | 5322 122 31863 | 63V 330pF 5% |
| 2217 | 5322 122 32658 | 22pF 5% 50V |
| 2218 | 5322 122 32658 | 22pF 5% 50V |
| 2222 | 5322 122 32658 | 22pF 5% 50V |
| 2225 | 5322 122 32658 | 22pF 5% 50V |
| 2227 | 4822 122 33575 | 220pF 5% 63V |
| 2231 | 5322 122 31863 | 63V 330pF 5% |
| 2233 | 5322 122 31863 | 63V 330pF 5% |
| 2236 | 5322 122 31863 | 63V 330pF 5% |
| 2238 | 5322 122 31863 | 63V 330pF 5% |
| 2242 | 5322 122 31863 | 63V 330pF 5% |
| 2244 | 5322 122 31863 | 63V 330pF 5% |
| 2246 | 4822 124 81286 | 47µF 20% 16V |
| 2247 | 5322 122 32658 | 22pF 5% 50V |
| 2248 | 5322 126 10223 | 4,7nF 10% 63V |
| 2249 | 4822 122 33575 | 220pF 5% 63V |
| 2251 | 5322 122 31863 | 63V 330pF 5% |
| 2253 | 5322 122 31863 | 63V 330pF 5% |
| 2261 | 4822 124 40196 | 220µF 20% 16V |
| 2262 | 5322 122 31647 | 1nF 10% 63V |
| 2265 | 4822 124 41643 | 100µF 20% 16V |
| 2265 | 4822 124 81044 | 470µF 20% 6,3V |
| 2266 | 2238 580 15645 | 50V 47nF 10% R |
| 2271 | 4822 124 21913 | 1µF 20% 63V |
| 2276 | 5322 126 10511 | 1nF 5% 50V |
| 2280 | 5322 122 32531 | 100pF 5% 50V |
| 2281 | 4822 122 33575 | 220pF 5% 63V |
| 2281 | 4822 126 13486 | 15pF 2% 63V |
| 2282 | 2238 580 15645 | 50V 47nF 10% R |
| 2282 | 4822 126 13751 | 47nF 10% 63V |
| 2284 | 4822 124 40207 | 100µF 20% 25V |
| 2404⚠ | 4822 122 31177 | 470pF 10% 500V |
| 2406 | 4822 121 43526 | 47nF 5% 250V |
| 2409 | 5322 121 42386 | 100nF 5% 63V |
| 2411⚠ | 2020 558 90491 | 1,8nF 10% 2KV |
| 2411⚠ | 4822 126 13435 | 1,2nF 10% 2KV |
| 2411⚠ | 4822 126 13451 | 2,2nF 10% 2KV |
| 2411⚠ | 4822 126 13862 | 1,5nF 10% 2KV |
| 2411⚠ | 4822 126 14053 | 1nF 10% 2KV |
| 2414⚠ | 4822 121 70618 | 12nF 5% 1600V |
| 2415⚠ | 4822 121 70434 | 11nF 5% 1600V |
| 2415⚠ | 4822 121 70617 | 10nF 5% 1600V |
| 2415⚠ | 4822 121 70618 | 12nF 5% 1600V |
| 2416⚠ | 2020 558 90491 | 1,8nF 10% 2KV |
| 2416⚠ | 4822 126 11503 | 820pF 10% 2KV |
| 2416⚠ | 4822 126 13435 | 1,2nF 10% 2KV |
| 2416⚠ | 4822 126 13451 | 2,2nF 10% 2KV |
| 2416⚠ | 4822 126 14053 | 1nF 10% 2KV |
| 2417⚠ | 4822 122 31177 | 470pF 10% 500V |
| 2418 | 2222 479 90029 | 820nF 5% 250V |
| 2418 | 4822 126 14097 | 680nF 5% 250V |
| 2419 | 4822 121 10518 | 390nF 5% 250V |
| 2419 | 4822 121 10781 | 470nF 5% 250V |
| 2419 | 4822 126 14097 | 680nF 5% 250V |
| 2420 | 4822 124 12265 | 4,7µF 20% 250V |
| 2420 | 4822 124 41741 | 2,2µF 20% 350V |
| 2421⚠ | 2222 479 90022 | 0.43µF 250V |
| 2421⚠ | 4822 121 10781 | 470nF 5% 250V |
| 2422 | 4822 126 13751 | 47nF 10% 63V |
| 2430 | 4822 121 41857 | 10nF 5% 250V |
| 2430 | 4822 121 70676 | 27P 10% 50V |
| 2434⚠ | 2020 021 91543 | 47µF 20% 160V |
| 2437 | 4822 121 10619 | 220nF 10% 250V |
| 2437 | 4822 121 40472 | 150nF 10% 250V |
| 2437 | 4822 121 40518 | 100nF 10% 250V |
| 2437 | 4822 121 42605 | 180nF 10% 250V |
| 2439 | 4822 121 51252 | 470nF 5% 63V |
| 2442 | 4822 126 13838 | 100nF 25V 20% |
| 2443 | 4822 126 13838 | 100nF 25V 20% |
| 2445 | 2020 012 93596 | 22µF 20% 250V |
| 2447 | 4822 124 80791 | 470µF 16V 20% |
| 2449 | 4822 124 80791 | 470µF 16V 20% |
| 2450 | 4822 124 80791 | 470µF 16V 20% |
| 2461 | 5322 121 42386 | 100nF 5% 63V |
| 2462 | 4822 124 40255 | 100µF 20% 63V |
| 2463 | 5322 121 42386 | 100nF 5% 63V |
| 2468 | 5322 121 40323 | 100nF 10% 100V |
| 2469 | 2222 479 90014 | 0.22µF 250V |
| 2469 | 2222 479 90166 | 68nF 5% 400V |
| 2473⚠ | 4822 122 31177 | 470pF 10% 500V |
| 2474⚠ | 4822 121 43288 | 18nF 10% 630V |
| 2474⚠ | 4822 121 70545 | 7,5nF 5% 1600V |
| 2475 | 4822 121 43526 | 47nF 5% 250V |
| 2476⚠ | 4822 121 70545 | 7,5nF 5% 1600V |
| 2476⚠ | 4822 121 70637 | 8,2nF 5% 1600V |
| 2476⚠ | 4822 121 70649 | 9,1nF 5% 1600V |
| 2477 | 2222 479 90022 | 0.43µF 250V |
| 2478 | 5322 121 10472 | 47µF 25V |
| 2479 | 4822 124 80341 | 1µF 20% 160V |
| 2479 | 4822 124 81043 | 10µF 20% 100V |
| 2484 | 4822 121 43526 | 47nF 5% 250V |
| 2485⚠ | 4822 126 10206 | 2,2nF 10% 500V |
| 2487⚠ | 4822 121 70545 | 7,5nF 5% 1600V |
| 2487⚠ | 4822 121 70649 | 9,1nF 5% 1600V |
| 2488 | 4822 126 14584 | 1µF 20% 16V |
| 2488 | 4822 126 14585 | 100nF 10% 50V |
| 2488 | 5322 126 10511 | 1nF 5% 50V |
| 2489 | 2222 479 90014 | 0.22µF 250V |
| 2491 | 4822 126 14076 | 220nF 25V |
| 2501 | 4822 126 10847 | 63V 1N8 10% |
| 2501 | 5322 122 32268 | 63V 470P 5% |
| 2503 | 4822 126 10847 | 63V 1N8 10% |
| 2503 | 5322 122 32268 | 63V 470P 5% |
| 2505 | 5322 121 42386 | 100nF 5% 63V |
| 2506 | 4822 124 40255 | 100µF 20% 63V |
| 2521 | 4822 121 42408 | 220nF 5% 63V |
| 2522 | 4822 124 40207 | 100µF 20% 25V |
| 2522 | 4822 124 40255 | 100µF 20% 63V |
| 2522 | 4822 124 41407 | 0,47µF 20% 63V |
| 2523 | 5322 121 42386 | 100nF 5% 63V |
| 2524 | 5322 121 42386 | 100nF 5% 63V |
| 2531 | 4822 124 40784 | 3300µF 20% 16V |
| 2532 | 4822 124 21913 | 1µF 20% 63V |
| 2536 | 4822 126 14335 | 1nF 10% 100V |
| 2701 | 4822 124 22652 | 2,2µF 20% 50V |
| 2701 | 5322 124 41379 | 2,2µF 20% 50V |
| 2702 | 4822 124 40255 | 100µF 20% 63V |
| 2703 | 4822 124 22652 | 2,2µF 20% 50V |
| 2703 | 5322 124 41379 | 2,2µF 20% 50V |
| 2704 | 4822 124 12056 | 1000µF 20% 35V |
| 2705 | 4822 124 21913 | 1µF 20% 63V |
| 2706 | 4822 126 13838 | 100nF 25V 20% |
| 2707 | 4822 123 14026 | 470µF 35V 20% |
| 2708 | 4822 124 21913 | 1µF 20% 63V |
| 2709 | 4822 124 12056 | 1000µF 20% 35V |
| 2711 | 4822 126 13482 | 470nF 80/20% 16V |
| 2711 | 4822 126 14491 | 2.2µF 10V |
| 2712 | 4822 124 40255 | 100µF 20% 63V |
| 2713 | 4822 126 13838 | 100nF 25V 20% |
| 2714 | 5322 122 32531 | 100pF 5% 50V |
| 2714 | 5322 126 10511 | 1nF 5% 50V |
| 2715 | 4822 124 40255 | 100µF 20% 63V |
| 2716 | 4822 126 13482 | 470nF 80/20% 16V |
| 2716 | 4822 126 14491 | 2.2µF 10V |
| 2717 | 5322 122 32531 | 100pF 5% 50V |
| 2717 | 5322 126 10511 | 1nF 5% 50V |
| 2718 | 4822 124 40255 | 100µF 20% 63V |
| 2719 | 5322 122 31647 | 1nF 10% 63V |
| 2720 | 5322 122 31647 | 1nF 10% 63V |
| 2722 | 4822 122 33127 | 2,2nF 10% 63V |
| 2723 | 4822 122 33127 | 2,2nF 10% 63V |
| 2726 | 4822 124 40255 | 100µF 20% 63V |
| 2727 | 5322 122 32654 | 22nF 10% 63V |
| 2728 | 5322 122 32654 | 22nF 10% 63V |
| 2729 | 5322 122 32654 | 22nF 10% 63V |
| 2730 | 5322 122 32654 | 22nF 10% 63V |
| 2731 | 4822 126 14043 | 1µF 20% 16V |
| 2732 | 4822 126 14043 | 1µF 20% 16V |
| 2733 | 4822 124 11947 | 10µF 20% 16V |
| 2734 | 5322 126 10223 | 4,7nF 10% 63V |
| 2830 | 4822 121 51473 | 470nF 20% 63V |
| 2831 | 4822 126 13599 | 3,3nF 10% 500V |
| 2832 | 4822 126 13694 | 68pF 1% 63V |
| 2833 | 4822 126 13694 | 68pF 1% 63V |
| 2834 | 4822 126 13694 | 68pF 1% 63V |
| 2835 | 4822 126 13838 | 100nF 25V 20% |
| 2836 | 4822 121 43897 | 1nF 5% 400V |
| 2840 | 4822 124 11565 | 10µF 20% 250V |
| 2843⚠ | 4822 126 13451 | 2,2nF 10% 2KV |
| 2860 | 4822 124 40207 | 100µF 20% 25V |
| 2866 | 4822 126 13482 | 470nF 16V |
| 2869 | 4822 121 40334 | 100nF 10% 100V |
| 2870 | 5322 122 32654 | 22nF 10% 63V |
| 2871 | 4822 124 40764 | 22µF 100 V |
| 2872⚠ | 4822 122 40112 | 560pF 10% 500V |
| 2873 | 4822 121 40516 | 22nF 10% 250V |
| 2877 | 5322 122 32658 | 22pF 5% 50V |
| 2878 | 5322 126 10733 | 680pF 5% 50V |
| 2902⚠ | 4822 126 13589 | 470nF 275V |
| 2905 | 4822 121 70141 | 33nF 5% 400V |
| 2908 | 4822 126 14153 | 2,2nF 10%B 1KV |
| 2909 | 4822 126 12263 | 220pF 10%) 2KV |
| 2909 | 4822 126 14153 | 2,2nF 10%B 1KV |
| 2915⚠ | 4822 124 12415 | 220µF 20% 400V |
| 2919 | 2020 021 90654 | 47µF 20% 50V |
| 2919 | 4822 124 80604 | 47µF 20% 50V |
| 2921 | 5322 122 32311 | 470pF 10% 100V |
| 2922 | 4822 126 13862 | 1,5nF 10% 2KV |
| 2925 | 5322 122 32311 | 470pF 10% 100V |
| 2927 | 3198 014 01520 | 1N5 10% 50V |
| 2927 | 4822 121 10779 | 1,5nF 10% 50V |
| 2929 | 4822 126 14049 | 1,5nF 20% 250V |
| 2929⚠ | 4822 126 14088 | 2,2nF 20% 250V |
| 2932 | 5322 122 32654 | 22nF 10% 63V |
| 2936⚠ | 3198 019 62210 | 220P 10% 1KV |
| 2936 | 4822 126 12263 | 220pF 10% 2KV |
| 2938⚠ | 3198 019 64710 | 470P 10% 1KV |
| 2938 | 4822 122 50116 | 470pF 10% 1KV |
| 2939 | 4822 124 42336 | 47µF 20% 160V |
| 2940 | 2020 021 91543 | 47µF 20% 160V |
| 2941 | 4822 122 31175 | 1nF 10% 500V |

| | | |
|---|---|---|
| 2942 | 4822 121 42408 | 220nF 5% 63V |
| 2943 | 4822 124 40784 | 3300µF 20% 16V |
| 2944 | 4822 124 40433 | 47µF 20% 25V |
| 2945 | 4822 124 81144 | 1000µF 16V |
| 2952 | 4822 126 14585 | 100nF 10% 50V |
| 2953 | 4822 126 13751 | 47nF 10% 63V |
| 2955 | 4822 122 33336 | 8,2nF 10% 50V |
| 2961 | 4822 122 31175 | 1nF 10% 500V |
| 2962 | 2020 021 91501 | 4700µF 20% 10V |
| 2962 | 4822 124 11878 | 4700µF 16V |
| 2962 | 4822 124 80061 | 1000µF 20% 25V |
| 2963 | 2238 780 15654 | 220nF 10% 16V |
| 2963 | 4822 126 13561 | 220nF 10% 16V |
| 2964 | 4822 122 31175 | 1nF 10% 500V |
| 2966 | 4822 124 41584 | 100µF 20% 10V |
| 2967 | 4822 124 41584 | 100µF 20% 10V |
| 2970 | 5322 122 32331 | 1nF 10% 100V |
| 2974 | 4822 124 11583 | 2200µF 20% 35V |
| 2974 | 4822 124 12056 | 1000µF 20% 35V |
| 2977 | 4822 124 41584 | 100µF 20% 10V |



| | | |
|---|---|---|
| 3002 | 4822 117 11504 | 270Ω 1% 0.1W |
| 3003 | 4822 117 11139 | 1k5 1% 0,1W |
| 3004 | 4822 051 20332 | 3k3 5% 0,1W |
| 3007 | 4822 117 10361 | 680Ω 1% 0,1W |
| 3007 | 4822 117 13577 | 330Ω 1% 1,25W |
| 3008 | 4822 051 10102 | 1k 2% 0,25W |
| 3021 | 4822 051 20561 | 560Ω 5% 0,1W |
| 3022 | 4822 051 20391 | 390Ω 5% 0,1W |
| 3023 | 4822 051 20561 | 560Ω 5% 0,1W |
| 3024 | 4822 051 10102 | 1k 2% 0,25W |
| 3025 | 4822 051 20391 | 390Ω 5% 0,1W |
| 3026 | 4822 117 11449 | 2k2 5% 0,1W |
| 3027 | 4822 051 20391 | 390Ω 5% 0,1W |
| 3028 | 4822 051 20562 | 5k6 5% 0,1W |
| 3029 | 4822 051 20472 | 4k7 5% 0,1W |
| 3030 | 4822 051 20122 | 1k2 5% 0,1W |
| 3031 | 4822 116 83933 | 15k 1% 0,1W |
| 3032 | 4822 051 20472 | 4k7 5% 0,1W |
| 3033 | 4822 116 83933 | 15k 1% 0,1W |
| 3034 | 4822 117 10833 | 10k 1% 0,1W |
| 3035⚠ | 4822 052 10229 | 22Ω 5% 0,33W |
| 3037 | 4822 051 20182 | 1k8 5% 0,1W |
| 3038 | 4822 051 20182 | 1k8 5% 0,1W |
| 3081 | 4822 117 10833 | 10k 1% 0,1W |
| 3082 | 4822 117 10833 | 10k 1% 0,1W |
| 3083 | 4822 116 52276 | 3k9 5% 0,5W |
| 3201 | 4822 116 83868 | 150Ω 5% 0,5W |
| 3202 | 4822 117 13579 | 220k 1% 0.1W |
| 3203 | 4822 116 83868 | 150Ω 5% 0,5W |
| 3204 | 4822 117 10834 | 47k 1% 0,1W |
| 3206 | 4822 116 83868 | 150Ω 5% 0,5W |
| 3207 | 4822 117 13579 | 220k 1% 0.1W |
| 3208 | 4822 116 83868 | 150Ω 5% 0,5W |
| 3209 | 4822 117 10834 | 47k 1% 0,1W |
| 3211 | 4822 116 52201 | 75Ω 5% 0,5W |
| 3212 | 4822 116 52175 | 100Ω 5% 0,5W |
| 3213 | 4822 116 52264 | 27k 5% 0,5W |
| 3214 | 4822 117 11507 | 6k8 1% 0,1W |
| 3215 | 4822 116 52175 | 100Ω 5% 0,5W |
| 3216 | 4822 116 52201 | 75Ω 5% 0,5W |
| 3217 | 4822 116 52175 | 100Ω 5% 0,5W |
| 3218 | 4822 116 52201 | 75Ω 5% 0,5W |
| 3219 | 4822 116 52175 | 100Ω 5% 0,5W |
| 3220 | 4822 051 20154 | 150k 5% 0,1W |
| 3220 | 4822 117 11149 | 82k 1% 0,1W |
| 3220 | 4822 117 13579 | 220k 1% 0.1W |
| 3221 | 4822 116 52201 | 75Ω 5% 0,5W |
| 3222 | 4822 116 52175 | 100Ω 5% 0,5W |
| 3223 | 4822 116 52199 | 68Ω 5% 0,5W |
| 3224 | 4822 051 10102 | 1k 2% 0,25W |
| 3226 | 4822 116 52201 | 75Ω 5% 0,5W |
| 3227 | 4822 116 52176 | 10Ω 5% 0,5W |
| 3231 | 4822 116 83868 | 150Ω 5% 0,5W |
| 3232 | 4822 117 13579 | 220k 1% 0.1W |
| 3233 | 4822 116 83868 | 150Ω 5% 0,5W |
| 3234 | 4822 117 10834 | 47k 1% 0,1W |
| 3236 | 4822 116 83868 | 150Ω 5% 0,5W |
| 3237 | 4822 117 13579 | 220k 1% 0.1W |
| 3238 | 4822 116 83868 | 150Ω 5% 0,5W |
| 3239 | 4822 117 10834 | 47k 1% 0,1W |
| 3241 | 4822 116 52264 | 27k 5% 0,5W |
| 3242 | 4822 117 11507 | 6k8 1% 0,1W |
| 3243 | 4822 116 52201 | 75Ω 5% 0,5W |
| 3244 | 4822 116 52175 | 100Ω 5% 0,5W |
| 3245 | 4822 116 52199 | 68Ω 5% 0,5W |
| 3246 | 4822 051 10102 | 1k 2% 0,25W |
| 3247⚠ | 5322 117 11726 | 10Ω 5% |
| 3248 | 4822 116 52201 | 75Ω 5% 0,5W |
| 3249 | 4822 116 52176 | 10Ω 5% 0,5W |
| 3251 | 4822 117 13579 | 220k 1% 0.1W |
| 3252 | 4822 116 83868 | 150Ω 5% 0,5W |
| 3253 | 4822 117 13579 | 220k 1% 0.1W |
| 3254 | 4822 116 83868 | 150Ω 5% 0,5W |
| 3255 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3256 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3257 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3263 | 4822 051 10102 | 1k 2% 0,25W |
| 3263 | 4822 117 11449 | 2k2 5% 0,1W |
| 3264 | 4822 117 10833 | 10k 1% 0,1W |
| 3267 | 4822 051 20109 | 10Ω 5% 0,1W |
| 3267 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3268 | 4822 051 20109 | 10Ω 5% 0,1W |
| 3268 | 4822 051 20479 | 47Ω 5% 0,1W |
| 3271 | 4822 051 20333 | 33k 5% 0,1W |
| 3271 | 4822 117 11149 | 82k 1% 0,1W |
| 3272 | 4822 117 10833 | 10k 1% 0,1W |
| 3272 | 4822 117 11449 | 2k2 5% 0,1W |
| 3273 | 4822 051 20223 | 22k 5% 0,1W |
| 3274 | 4822 051 20154 | 150k 5% 0,1W |
| 3276 | 4822 117 10833 | 10k 1% 0,1W |
| 3276 | 4822 117 11449 | 2k2 5% 0,1W |
| 3277 | 4822 051 20101 | 100Ω 5% 0,1W |
| 3277 | 4822 117 11373 | 100Ω 1% 0,1W |
| 3278 | 4822 117 11503 | 220Ω 1% 0.1W |
| 3280 | 4822 051 20333 | 33k 5% 0,1W |
| 3281 | 4822 051 20472 | 4k7 5% 0,1W |
| 3282 | 4822 117 10834 | 47k 1% 0,1W |
| 3286 | 4822 051 20182 | 1k8 5% 0,1W |
| 3401 | 4822 116 52175 | 100Ω 5% 0,5W |
| 3402 | 4822 050 11002 | 1k 1% 0,4W |
| 3403 | 4822 116 52269 | 3k3 5% 0,5W |
| 3405 | 4822 117 12473 | 4k7 5% 5W |
| 3405 | 4822 117 12514 | 6k8 5% 5W |
| 3405 | 4822 117 12517 | 5k6 5% 5W |
| 3409 | 2322 193 53333 | 33k 5% |
| 3409 | 4822 053 10333 | 33k 5% 1W |
| 3410 | 4822 116 52191 | 33Ω 5% 0,5W |
| 3411 | 4822 053 21334 | 330k 5% 0,5W |
| 3412 | 4822 116 52234 | 100k 5% 0,5W |
| 3412 | 4822 116 52251 | 18k 5% 0,5W |
| 3414 | 4822 116 52234 | 100k 5% 0,5W |
| 3417 | 4822 116 52228 | 680Ω 5% 0,5W |
| 3422 | 3198 012 11030 | 10k 5% 1W |
| 3422 | 4822 053 10103 | 10k 5% 1W |
| 3430 | 4822 053 12339 | 33Ω 5% 3W |
| 3430 | 4822 053 12689 | 68Ω 5% 3W |
| 3432 | 4822 051 20824 | 820k 5% 0,1W |
| 3434 | 4822 053 12689 | 68Ω 5% 3W |
| 3435 | 4822 116 52264 | 27k 5% 0,5W |
| 3435 | 4822 116 83882 | 39k 5% 0,5W |
| 3435 | 4822 116 83884 | 47k 5% 0,5W |
| 3436 | 4822 116 52291 | 56k 5% 0,5W |
| 3436 | 4822 116 52297 | 68k 5% 0,5W |
| 3436 | 4822 116 83882 | 39k 5% 0,5W |
| 3436 | 4822 116 83884 | 47k 5% 0,5W |
| 3437 | 4822 050 23303 | 33k 1% 0,6W |
| 3437 | 4822 116 52257 | 22k 5% 0,5W |
| 3438 | 4822 051 20474 | 470k 5% 0,1W |
| 3439 | 4822 050 11002 | 1k 1% 0,4W |
| 3440 | 4822 117 10837 | 100k 1% 0.1W |
| 3441 | 4822 116 83961 | 6k8 5% |
| 3442 | 4822 051 20105 | 1M 5% 0,1W |
| 3442 | 4822 051 20564 | 560k 5% 0,1W |
| 3442 | 4822 051 20824 | 820k 5% 0,1W |
| 3445⚠ | 4822 052 11108 | 1Ω 5% 0,5W |
| 3446⚠ | 4822 052 11108 | 1Ω 5% 0,5W |
| 3447⚠ | 4822 052 11108 | 1Ω 5% 0,5W |
| 3448⚠ | 4822 052 11108 | 1Ω 5% 0,5W |
| 3449⚠ | 4822 052 11108 | 1Ω 5% 0,5W |
| 3451 | 4822 116 52234 | 100k 5% 0,5W |
| 3451 | 4822 117 10837 | 100k 1% 0.1W |
| 3456 | 4822 051 10102 | 1k 2% 0,25W |
| 3470 | 4822 116 52264 | 27k 5% 0,5W |
| 3471 | 4822 116 83883 | 470Ω 5% 0,5W |
| 3472 | 4822 050 23303 | 33k 1% 0,6W |
| 3472 | 4822 116 52264 | 27k 5% 0,5W |
| 3472 | 4822 116 52304 | 82k 5% 0,5W |
| 3472 | 4822 116 83882 | 39k 5% 0,5W |
| 3473 | 4822 116 52234 | 100k 5% 0,5W |
| 3473 | 4822 116 52304 | 82k 5% 0,5W |
| 3474 | 4822 050 24708 | 4Ω7 1% 0,6W |
| 3475 | 4822 050 24708 | 4Ω7 1% 0,6W |
| 3476 | 4822 116 52283 | 4k7 5% 0,5W |
| 3477 | 4822 116 52238 | 12k 5% 0,5W |
| 3478 | 4822 050 21003 | 10k 1% 0,6W |
| 3479 | 4822 116 52234 | 100k 5% 0,5W |
| 3480 | 4822 050 21003 | 10k 1% 0,6W |
| 3481 | 4822 050 21003 | 10k 1% 0,6W |
| 3482 | 4822 116 52245 | 150k 5% 0,5W |
| 3483 | 4822 116 52291 | 56k 5% 0,5W |
| 3486 | 4822 050 21003 | 10k 1% 0,6W |
| 3487 | 4822 052 11108 | 1Ω 5% 0,5W |
| 3492 | 4822 053 21334 | 330k 5% 0,5W |
| 3493 | 4822 050 21003 | 10k 1% 0,6W |
| 3494 | 4822 116 52264 | 27k 5% 0,5W |
| 3494 | 4822 116 83882 | 39k 5% 0,5W |
| 3495 | 3198 012 32280 | 2Ω2 5% 3W |
| 3496 | 3198 012 32280 | 2Ω2 5% 3W |
| 3497 | 3198 012 32280 | 2Ω2 5% 3W |
| 3498 | 4822 117 10837 | 100k 1% 0.1W |
| 3498 | 4822 117 11149 | 82k 1% 0,1W |
| 3499 | 4822 117 13579 | 220k 1% 0.1W |
| 3501 | 4822 051 10102 | 1k 2% 0,25W |
| 3503 | 4822 051 10102 | 1k 2% 0,25W |
| 3504 | 4822 050 22202 | 2k2 1% 0,6W |
| 3504 | 4822 116 52256 | 2k2 5% 0,5W |
| 3511 | 4822 116 52283 | 4k7 5% 0,5W |
| 3512 | 4822 117 10833 | 10k 1% 0,1W |
| 3513 | 4822 117 10833 | 10k 1% 0,1W |
| 3521⚠ | 4822 052 10158 | 1Ω5 5% 0,33W |
| 3522 | 4822 050 21003 | 10k 1% 0,6W |
| 3522 | 4822 116 83866 | 1M 5% 0,5W |
| 3523 | 4822 116 52175 | 100Ω 5% 0,5W |
| 3524 | 4822 116 52175 | 100Ω 5% 0,5W |
| 3525 | 4822 050 24708 | 4Ω7 1% 0,6W |
| 3525 | 4822 116 81154 | 2Ω2 5% 0,5W |
| 3525 | 5322 116 53564 | 3Ω3 5% 0.5W |
| 3526 | 4822 050 24708 | 4Ω7 1% 0,6W |
| 3526 | 5322 116 53564 | 3Ω3 5% 0.5W |
| 3527 | 4822 116 81039 | 1Ω8 5% 0,5W |
| 3527 | 5322 116 53564 | 3Ω3 5% 0.5W |
| 3528 | 4822 050 22202 | 2k2 1% 0,6W |
| 3528 | 4822 116 52256 | 2k2 5% 0,5W |
| 3531 | 4822 051 20688 | 6Ω8 5% 0,1W |
| 3701 | 4822 051 20472 | 4k7 5% 0,1W |
| 3701 | 4822 051 20562 | 5k6 5% 0,1W |
| 3702 | 4822 051 20472 | 4k7 5% 0,1W |
| 3702 | 4822 051 20562 | 5k6 5% 0,1W |
| 3703 | 4822 117 11449 | 2k2 5% 0,1W |
| 3704 | 4822 116 52291 | 56k 5% 0,5W |
| 3705 | 4822 051 20182 | 1k8 5% 0,1W |
| 3705 | 4822 051 20471 | 470Ω 5% 0,1W |
| 3706 | 4822 117 10833 | 10k 1% 0,1W |
| 3707 | 4822 117 10833 | 10k 1% 0,1W |
| 3708 | 4822 117 10837 | 100k 1% 0.1W |
| 3709 | 4822 117 11503 | 220Ω 1% 0.1W |
| 3710 | 4822 051 20392 | 3k9 5% 0,1W |
| 3710 | 4822 117 10833 | 10k 1% 0,1W |
| 3711 | 4822 051 20392 | 3k9 5% 0,1W |
| 3711 | 4822 117 10833 | 10k 1% 0,1W |
| 3712 | 4822 051 20822 | 8k2 5% 0,1W |
| 3713 | 4822 051 20223 | 22k 5% 0,1W |
| 3713 | 4822 117 11139 | 1k5 1% 0,1W |
| 3715 | 4822 051 20332 | 3k3 5% 0,1W |
| 3716 | 4822 051 20822 | 8k2 5% 0,1W |
| 3717 | 4822 117 11139 | 1k5 1% 0,1W |
| 3717 | 4822 117 12955 | 2k7 1% 0,1W |
| 3719 | 4822 117 12955 | 2k7 1% 0,1W |
| 3720 | 4822 051 10102 | 1k 2% 0,25W |
| 3720 | 4822 051 20332 | 3k3 5% 0,1W |
| 3721 | 4822 117 10837 | 100k 1% 0.1W |
| 3722 | 4822 117 12955 | 2k7 1% 0,1W |
| 3723 | 4822 051 20332 | 3k3 5% 0,1W |
| 3724 | 4822 051 20472 | 4k7 5% 0,1W |
| 3724 | 4822 051 20562 | 5k6 5% 0,1W |
| 3725 | 4822 051 20472 | 4k7 5% 0,1W |
| 3725 | 4822 051 20562 | 5k6 5% 0,1W |
| 3726 | 4822 051 20109 | 10Ω 5% 0,1W |
| 3727 | 4822 116 52176 | 10Ω 5% 0,5W |
| 3728 | 4822 051 20109 | 10Ω 5% 0,1W |
| 3730 | 4822 051 20273 | 27k 5% 0,1W |
| 3731 | 4822 051 20273 | 27k 5% 0,1W |
| 3732 | 4822 116 52234 | 100k 5% 0,5W |
| 3733 | 4822 051 20561 | 560Ω 5% 0,1W |
| 3734 | 4822 051 20478 | 4Ω7 5% 0,1W |
| 3735 | 4822 051 20478 | 4Ω7 5% 0,1W |
| 3736⚠ | 4822 052 10108 | 1Ω 5% 0,33W |
| 3737⚠ | 4822 052 10108 | 1Ω 5% 0,33W |
| 3831 | 4822 116 52175 | 100Ω 5% 0,5W |
| 3832 | 3198 013 01020 | 1k PM2 1/2W |
| 3833 | 4822 116 52175 | 100Ω 5% 0,5W |
| 3834 | 3198 013 01020 | 1k PM2 1/2W |
| 3835 | 4822 116 52175 | 100Ω 5% 0,5W |
| 3836 | 3198 013 01020 | 1k PM2 1/2W |
| 3837 | 4822 051 20561 | 560Ω 5% 0,1W |
| 3837 | 4822 117 10361 | 680Ω 1% 0,1W |
| 3838 | 4822 051 20561 | 560Ω 5% 0,1W |
| 3838 | 4822 117 10361 | 680Ω 1% 0,1W |
| 3839 | 4822 051 20561 | 560Ω 5% 0,1W |
| 3839 | 4822 117 10361 | 680Ω 1% 0,1W |
| 3840⚠ | 4822 052 10101 | 100Ω 5% 0,33W |
| 3841⚠ | 4822 052 10108 | 1Ω 5% 0,33W |
| 3842⚠ | 4822 052 10108 | 1Ω 5% 0,33W |
| 3843 | 3198 013 01520 | 1k5 PM2 1/2W |
| 3845 | 4822 116 52272 | 330k 5% 0,5W |
| 3860⚠ | 4822 052 10109 | 10Ω 5% 0,33W |
| 3864 | 4822 117 11503 | 220Ω 1% 0.1W |
| 3865 | 4822 117 10833 | 10k 1% 0,1W |

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|---|---|---|
| 3866 | 4822 117 11139 | 1k5 1% 0,1W |
| 3867 | 4822 116 52176 | 10Ω 5% 0,5W |
| 3869 | 4822 051 20008 | 0Ω jumper |
| 3870 | 4822 116 52231 | 820Ω 5% 0,5W |
| 3871 | 4822 116 52291 | 56k 5% 0,5W |
| 3872 | 4822 117 11148 | 56k 1% 0,1W |
| 3873 | 4822 117 11454 | 820Ω 1% 0,1W |
| 3874 | 4822 117 13424 | 8k2 5% 5W |
| 3875 | 4822 051 20122 | 1k2 5% 0,1W |
| 3876 | 4822 051 20159 | 15Ω 5% 0,1W |
| 3877 | 4822 051 20008 | 0Ω jumper |
| 3878 | 4822 051 20471 | 470Ω 5% 0,1W |
| 3880 | 4822 116 83872 | 220Ω 5% 0,5W |
| 3881 | 4822 051 20008 | 0Ω jumper |
| 3885 | 4822 117 11449 | 2k2 5% 0,1W |
| 3886 | 2322 194 63338 | 3Ω3 5% |
| 3887 | 2322 194 63338 | 3Ω3 5% |
| 3888 | 4822 051 20159 | 15Ω 5% 0,1W |
| 3891 | 4822 117 11454 | 820Ω 1% 0,1W |
| 3892 | 4822 117 13016 | 1M 50V |
| 3901 | 4822 053 21475 | 4M7 5% 0,5W |
| 3902 | 4822 053 21225 | 2M2 5% 0,5W |
| 3905 | 3198 013 04710 | 470Ω PM2 1/2W |
| 3907 | 4822 117 12074 | 7W 1Ω5 10% |
| 3911⚠ | 4822 116 10075 | 9Ω 220V |
| 3911⚠ | 4822 116 10105 | 9Ω 220V PTC |
| 3913⚠ | 2322 193 53154 | 150k 5% |
| 3915 | 4822 053 20335 | 3M3 5% 0,25W |
| 3917 | 4822 051 20561 | 560Ω 5% 0,1W |
| 3923 | 2120 106 90555 | 0Ω33 5% 1W |
| 3923 | 4822 117 11342 | 0Ω33 5% 2W |
| 3924 | 2120 106 90554 | 0Ω22 5% 1W |
| 3924 | 4822 117 11744 | 0Ω22 5% 1W |
| 3925 | 4822 116 52228 | 680Ω 5% 0,5W |
| 3926 | 4822 116 52269 | 3k3 5% 0,5W |
| 3928 | 4822 116 52263 | 2k7 5% 0,5W |
| 3929 | 5322 116 53564 | 3Ω3 5% 0.5W |
| 3931 | 4822 117 10833 | 10k 1% 0,1W |
| 3932 | 4822 117 10833 | 10k 1% 0,1W |
| 3942 | 2120 108 92616 | 1k2 5% 0,1W |
| 3942 | 4822 051 20122 | 1k2 5% 0,1W |
| 3943 | 4822 116 83881 | 390Ω 5% 0,5W |
| 3944 | 4822 116 52257 | 22k 5% 0,5W |
| 3946 | 4822 051 20223 | 22k 5% 0,1W |
| 3947 | 4822 051 10102 | 1k 2% 0,25W |
| 3947 | 5322 117 12487 | 1k 1% 0,125W |
| 3948 | 4822 051 20683 | 68k 5% 0,1W |
| 3951 | 4822 051 20562 | 5k6 5% 0,1W |
| 3952 | 4822 117 11149 | 82k 1% 0,1W |
| 3953 | 4822 117 10833 | 10k 1% 0,1W |
| 3954 | 4822 051 20562 | 5k6 5% 0,1W |
| 3955 | 4822 117 10833 | 10k 1% 0,1W |
| 3957 | 4822 051 20182 | 1k8 5% 0,1W |
| 3958 | 4822 051 10102 | 1k 2% 0,25W |
| 3962 | 4822 051 20562 | 5k6 5% 0,1W |
| 3963 | 4822 051 20109 | 10Ω 5% 0,1W |
| 3965 | 4822 051 20229 | 22Ω 5% 0,1W |
| 3966 | 4822 117 10361 | 680Ω 1% 0,1W |
| 3967 | 4822 116 52219 | 330Ω 5% 0,5W |
| 3968 | 4822 117 12955 | 2k7 1% 0,1W |
| 3969 | 4822 050 21003 | 10k 1% 0,6W |
| 3970 | 3198 012 32290 | 22Ω 5% 3W |
| 3970 | 4822 053 12229 | 22Ω 5% 3W |
| 3977 | 4822 117 12955 | 2k7 1% 0,1W |
| 3978 | 4822 117 10833 | 10k 1% 0,1W |
| 3979 | 4822 116 83933 | 15k 1% 0,1W |
| 3986 | 4822 051 20333 | 33k 5% 0,1W |
| 3987 | 4822 117 10833 | 10k 1% 0,1W |
| 3989 | 4822 051 20334 | 330k 5% 0,1W |
| 3991 | 4822 116 52257 | 22k 5% 0,5W |
| 3992 | 4822 117 10833 | 10k 1% 0,1W |
| 3993 | 4822 117 10833 | 10k 1% 0,1W |
| 3994 | 4822 116 83933 | 15k 1% 0,1W |
| 3996⚠ | 4822 053 21155 | 1M5 5% 0,5W |
| 3997 | 4822 117 11373 | 100Ω 1% |
| 4xxx | 4822 051 10008 | 0Ω 5% 0,25W |
| 4xxx | 4822 051 20008 | 0Ω 5% 0,25W |

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|---|---|---|
| 5001 | 4822 051 20008 | 0R00 jumper |
| 5001 | 4822 157 11828 | 22U 20% |
| 5002 | 4822 051 20008 | 0R00 Jumper |
| 5002 | 4822 157 11828 | 22U 20% |
| 5012 | 4822 157 11771 | 0,09µH 10% |
| 5201 | 4822 157 11235 | 22µH 5% |
| 5202 | 4822 157 11235 | 22µH 5% |
| 5261 | 4822 157 11778 | 5U6 10% |
| 5262 | 4822 157 50943 | 12µH |
| 5406 | 3128 138 33811 | Line drive trafo |
| 5406 | 4822 142 40351 | Line drive trafo |
| 5411 | 4822 157 11411 | Bead |
| 5417⚠ | 3128 138 53221 | Lin. cor. coil |
| 5417⚠ | 4822 157 11673 | Lin. cor. coil |
| 5417⚠ | 4822 157 11854 | Lin. cor. coil |
| 5417⚠ | 4822 157 71914 | Lin. cor. coil |
| 5430 | 4822 157 10359 | 33U 5% |
| 5431⚠ | 2422 531 98025 | LOT 1362.0004 |
| 5431⚠ | 2422 531 98026 | LOT 1362.0003 |
| 5431⚠ | 3128 138 21001 | LOT type1 |
| 5431⚠ | 4822 140 10651 | LOT 1342.0005 |
| 5445 | 4822 157 50964 | 100µH |
| 5446 | 4822 157 11672 | 12µH 5% |
| 5448 | 4822 157 11672 | 12µH 5% |
| 5474⚠ | 3128 138 31012 | Choke coil |
| 5474⚠ | 4822 157 62828 | Choke coil |
| 5478 | 2422 531 02419 | Bridge coil |
| 5521 | 4822 157 11771 | 0,09µH 10% |
| 5523 | 4822 157 11771 | 0,09µH 10% |
| 5524 | 4822 157 11771 | 0,09µH 10% |
| 5842 | 4822 157 71514 | 18U 5% |
| 5842 | 4822 157 71515 | 68U 5% |
| 5862 | 4822 157 51216 | 5,6µH |
| 5902⚠ | 4822 157 11122 | Line filter 15mH |
| 5902⚠ | 4822 157 11523 | Line filter 5mH |
| 5903⚠ | 4822 157 10999 | Line filter |
| 5912⚠ | 2422 531 02375 | Transformer SMT |
| 5920 | 4822 526 10704 | Bead |
| 5924 | 4822 526 10704 | Bead |
| 5936 | 4822 526 10704 | Bead |
| 5939 | 4822 157 71401 | 27µH |
| 5941 | 4822 526 10704 | Bead |
| 5961 | 4822 526 10704 | Bead |
| 5971 | 4822 526 10704 | Bead |

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|---|---|---|
| 6005 | 4822 130 31983 | BAT85 |
| 6010 | 4822 130 83757 | BAS216 |
| 6012 | 4822 130 31983 | BAT85 |
| 6013 | 4822 130 31983 | BAT85 |
| 6264 | 4822 130 83757 | BAS216 |
| 6265 | 4822 130 83757 | BAS216 |
| 6266 | 4822 130 11397 | BAS316 |
| 6271 | 4822 130 11397 | BAS316 |
| 6273 | 4822 130 11397 | BAS316 |
| 6274 | 4822 130 11397 | BAS316 |
| 6275 | 4822 130 11397 | BAS316 |
| 6276 | 4822 130 11397 | BAS316 |
| 6278 | 4822 130 11397 | BAS316 |
| 6279 | 3198 020 55680 | BZX384-C5V6 |
| 6279 | 4822 130 10185 | UDZS5.6B |
| 6280 | 4822 130 10852 | BZX284-C6V8 |
| 6280 | 9322 107 42685 | UDZ12B |
| 6280 | 9340 548 61115 | PDZ12B |
| 6281 | 4822 130 10852 | BZX284-C6V8 |
| 6281 | 9322 107 42685 | UDZ12B |
| 6281 | 9340 548 61115 | PDZ12B |
| 6282 | 4822 130 10852 | BZX284-C6V8 |
| 6282 | 9322 107 42685 | UDZ12B |
| 6282 | 9340 548 61115 | PDZ12B |
| 6283 | 4822 130 10852 | BZX284-C6V8 |
| 6283 | 9322 107 42685 | UDZ12B |
| 6283 | 9340 548 61115 | PDZ12B |
| 6284 | 4822 130 10852 | BZX284-C6V8 |
| 6284 | 9322 107 42685 | UDZ12B |
| 6284 | 9340 548 61115 | PDZ12B |
| 6285 | 4822 130 10852 | BZX284-C6V8 |
| 6285 | 9322 107 42685 | UDZ12B |
| 6285 | 9340 548 61115 | PDZ12B |
| 6286 | 4822 130 10852 | BZX284-C6V8 |
| 6286 | 9322 107 42685 | UDZ12B |
| 6286 | 9340 548 61115 | PDZ12B |
| 6287 | 4822 130 10852 | BZX284-C6V8 |
| 6287 | 9322 107 42685 | UDZ12B |
| 6287 | 9340 548 61115 | PDZ12B |
| 6288 | 4822 130 10852 | BZX284-C6V8 |
| 6288 | 9322 107 42685 | UDZ12B |
| 6288 | 9340 548 61115 | PDZ12B |
| 6289 | 4822 130 10852 | BZX284-C6V8 |
| 6289 | 9322 107 42685 | UDZ12B |
| 6289 | 9340 548 61115 | PDZ12B |
| 6413 | 4822 130 30621 | 1N4148 |
| 6414⚠ | 4822 130 83825 | BY328/20 |
| 6414 | 9340 559 50112 | BY228/24 |
| 6419 | 4822 130 42488 | BYD33D |
| 6420 | 4822 130 42488 | BYD33D |
| 6439 | 4822 130 34379 | BZX79-B27 |
| 6440 | 4822 130 30621 | 1N4148 |
| 6442 | 4822 130 30621 | 1N4148 |
| 6443 | 4822 130 30621 | 1N4148 |
| 6445 | 4822 130 42606 | BYD33J |
| 6447 | 4822 130 41602 | BYW95C |
| 6448 | 4822 130 41602 | BYW95C |
| 6461 | 4822 130 42488 | BYD33D |
| 6467 | 4822 130 11148 | UDZ4.7B |
| 6468 | 3198 020 51090 | BZX384-C10 |
| 6468 | 9322 107 41685 | UDZ10B |
| 6472 | 4822 130 61219 | BZX79-B10 |
| 6474⚠ | 9340 559 53112 | BYW95C-24 |
| 6475 | 9340 559 53112 | BYW95C-24 |
| 6480 | 4822 130 30621 | 1N4148 |
| 6481 | 3198 010 53390 | BZX79-B33 |
| 6482 | 4822 130 42606 | BYD33J |
| 6483 | 4822 130 42606 | BYD33J |
| 6484 | 4822 130 42606 | BYD33J |
| 6485 | 4822 130 20299 | P0102DA |
| 6486 | 4822 130 34379 | BZX79-B27 |
| 6487 | 4822 130 34142 | BZX79-B33 |
| 6505 | 4822 130 42488 | BYD33D |
| 6511 | 4822 130 30621 | 1N4148 |
| 6512 | 4822 130 34173 | BZX79-B5V6 |
| 6522 | 4822 130 42488 | BYD33D |
| 6523 | 4822 130 11397 | BAS316 |
| 6524 | 4822 130 11397 | BAS316 |
| 6701 | 4822 130 30621 | 1N4148 |
| 6831 | 4822 130 30842 | BAV21 |
| 6832 | 4822 130 83757 | BAS216 |
| 6833 | 4822 130 30842 | BAV21 |
| 6835 | 4822 130 30842 | BAV21 |
| 6837 | 4822 130 82969 | BZD23-C24 |
| 6838 | 4822 130 82969 | BZD23-C24 |
| 6863 | 4822 130 30621 | 1N4148 |
| 6904 | 4822 130 34142 | BZX79-B33 |
| 6905 | 4822 130 34142 | BZX79-B33 |
| 6911 | 4822 130 31083 | BYW55 |
| 6912 | 4822 130 31083 | BYW55 |
| 6913 | 4822 130 31083 | BYW55 |
| 6914 | 4822 130 31083 | BYW55 |
| 6921 | 4822 130 34142 | BZX79-B33 |
| 6926 | 4822 130 42488 | BYD33D |
| 6928 | 4822 130 42488 | BYD33D |
| 6929 | 4822 130 42488 | BYD33D |
| 6932 | 4822 130 30621 | 1N4148 |
| 6938 | 4822 130 10218 | BY229X-800 |
| 6941 | 4822 130 32715 | SB340 |
| 6941 | 4822 130 83865 | SB360 |
| 6942 | 4822 130 42488 | BYD33D |
| 6953 | 4822 130 34382 | BZX79-B8V2 |
| 6955 | 4822 130 30621 | 1N4148 |
| 6961 | 4822 130 32715 | SB340 |
| 6966 | 3198 010 53980 | BZX79-B3V9 |
| 6966 | 4822 130 31981 | BZX79-B3V9 |
| 6971 | 4822 130 10256 | EGP20DL-5300 |
| 6973 | 4822 130 30621 | 1N4148 |
| 6977 | 9322 127 99685 | UDZS5.1B |
| 6986 | 4822 130 34281 | BZX79-B15 |
| 6991 | 4822 130 34382 | BZX79-B8V2 |

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|---|---|---|
| 7012 | 4822 130 40959 | BC547B |
| 7013 | 4822 130 44568 | BC557B |
| 7014 | 4822 130 40981 | BC337-25 |
| 7015 | 4822 130 40981 | BC337-25 |
| 7224 | 4822 130 60511 | BC847B |
| 7224 | 5322 130 60159 | BC846B |
| 7226 | 4822 130 60511 | BC847B |
| 7226 | 5322 130 60159 | BC846B |
| 7273 | 4822 130 60373 | BC856B |
| 7276 | 4822 130 60511 | BC847B |
| 7276 | 5322 130 60159 | BC846B |
| 7277 | 4822 130 60373 | BC856B |
| 7280 | 4822 130 60511 | BC847B |
| 7280 | 5322 130 60159 | BC846B |
| 7408 | 4822 130 41646 | BF423 |
| 7410⚠ | 9340 550 89127 | BU4508AX |
| 7440 | 4822 130 44568 | BC557B |
| 7464 | 4822 130 44568 | BC557B |
| 7467 | 4822 130 60373 | BC856B |
| 7470 | 4822 130 11336 | STP16NE06FP |
| 7478 | 4822 130 40959 | BC547B |
| 7480 | 4822 130 40959 | BC547B |
| 7481 | 4822 130 42159 | BF819 |
| 7482 | 9340 547 00215 | PDTC143ZT |
| 7501 | 4822 209 61117 | TDA8172 |
| 7513 | 4822 130 60511 | BC847B |
| 7513 | 5322 130 60159 | BC846B |
| 7701 | 4822 130 60511 | BC847B |
| 7701 | 5322 130 60159 | BC846B |
| 7702 | 9322 148 81667 | AN5277 |
| 7703 | 4822 209 33165 | TDA1308T/N1 |
| 7704 | 4822 130 60511 | BC847B |
| 7704 | 5322 130 60159 | BC846B |
| 7710 | 4822 130 60511 | BC847B |
| 7710 | 5322 130 60159 | BC846B |
| 7711 | 4822 130 60373 | BC856B |
| 7712 | 4822 130 60373 | BC856B |
| 7830 | 9352 576 50112 | TDA6107Q/N2 |

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|---|---|---|
| 7860 | 4822 130 44154 | BF199 |
| 7861 | 4822 130 42589 | BF370 |
| 7862 | 4822 130 41617 | BD830 |
| 7863 | 4822 130 41616 | BD829 |
| 7864 | 4822 130 44568 | BC557B |
| 7865 | 9340 350 20116 | BFQ151 |
| 7921⚠ | 9322 140 38682 | STR-F6454 |
| 7922 | 4822 130 60373 | BC856B |
| 7929⚠ | 8238 274 02070 | TCET1103G |
| 7932 | 4822 130 60511 | BC847B |
| 7932 | 5322 130 60159 | BC846B |
| 7942 | 4822 209 80591 | LM317T |
| 7944 | 4822 130 60511 | BC847B |
| 7944 | 5322 130 60159 | BC846B |
| 7946 | 4822 130 60511 | BC847B |
| 7946 | 5322 130 60159 | BC846B |
| 7948 | 4822 130 60511 | BC847B |
| 7948 | 5322 130 60159 | BC846B |
| 7951 | 4822 130 60511 | BC847B |
| 7951 | 5322 130 60159 | BC846B |
| 7953 | 4822 130 60511 | BC847B |
| 7953 | 5322 130 60159 | BC846B |
| 7955 | 4822 130 60511 | BC847B |
| 7955 | 5322 130 60159 | BC846B |
| 7965 | 4822 130 40855 | BC337 |
| 7967 | 9322 137 01682 | SI-3050C |
| 7971 | 4822 209 16707 | SE140N |
| 7987 | 4822 130 60373 | BC856B |
| 7990 | 4822 130 60373 | BC856B |
| 7991 | 4822 130 60511 | BC847B |
| 7991 | 5322 130 60159 | BC846B |
| 7992 | 4822 130 60511 | BC847B |
| 7992 | 5322 130 60159 | BC846B |
| 9015 | 4822 157 62552 | 2,2UH |
| 9016 | 4822 157 62552 | 2,2UH |

| | | |
|---|---|---|
| 3473 | 4822 051 30008 | jumper |
| 3474 | 3198 021 90030 | jumper 0603 |
| 3474 | 4822 051 30008 | jumper |
| 3477 | 4822 051 30472 | 4k7 5% 0.062W |
| 3480 | 4822 051 30102 | 1k 5% 0.062W |
| 3481 | 4822 051 30103 | 10k 5% 0.062W |
| 3482 | 4822 051 30153 | 15k 5% 0.062W |
| 3485 | 4822 051 30479 | 47Ω 5% 0.062W |
| 3601 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3602 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3606 | 4822 051 30273 | 27k 5% 0.062W |
| 3616 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3618 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3619 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3621 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3643 | 4822 051 30563 | 56k 5% 0.062W |
| 3644 | 4822 117 13632 | 100k 1% 0603 0.62W |
| 3645 | 4822 051 30102 | 1k 5% 0.062W |
| 3646 | 4822 051 30563 | 56k 5% 0.062W |
| 3647 | 4822 117 13632 | 100k 1% 0603 0.62W |
| 3648 | 4822 051 30102 | 1k 5% 0.062W |
| 3651 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3653 | 4822 051 30101 | 100Ω 5% 0.062W |
| 3665 | 4822 051 30222 | 2k2 5% 0.062W |
| 3680 | 4822 051 30109 | 10Ω 5% 0.062W |
| 3681 | 4822 051 30109 | 10Ω 5% 0.062W |
| 4xxx | 4822 051 10008 | jumper (1206) |
| 4xxx | 4822 051 20008 | jumper(0805) |

| | | |
|---|---|---|
| 5040 | 3198 018 64780 | 4U7 5% |
| 5041 | 3198 018 64780 | 4U7 5% |
| 5042 | 3198 018 64780 | 4U7 5% |
| 5050 | 4822 157 11778 | 5U6 10% |
| 5309 | 4822 157 71334 | 0.68µH |
| 5332 | 4822 157 71334 | 0.68µH |
| 5333 | 4822 157 71334 | 0.68µH |
| 5334 | 3198 018 61080 | 1U 5% |
| 5334 | 4822 157 71334 | 0.68µH |
| 5401 | 4822 157 71694 | 0U82 10% |
| 5403 | 4822 157 71334 | 0.68µH |
| 5421 | 4822 157 71334 | 0.68µH |
| 5425 | 4822 157 71334 | 0.68µH |
| 5435 | 4822 157 71334 | 0.68µH |
| 5601 | 3198 018 61080 | 1U 5% |
| 5602 | 3198 018 64780 | 4U7 5% |
| 5625 | 3198 018 61080 | 1U 5% |
| 5665 | 3198 018 61590 | 15U 5% |

| | | |
|---|---|---|
| 6020 | 4822 130 83649 | 1SS355 |
| 6031 | 4822 130 11518 | UDZ2.4B |
| 6302 | 4822 130 10837 | UDZS8.2B |
| 6303 | 9322 137 65685 | UDZS6.8B |
| 6401 | 4822 130 11525 | 1SS356 |
| 6412 | 4822 130 83649 | 1SS355 |
| 6415 | 4822 130 83649 | 1SS355 |
| 6417 | 4822 130 83649 | 1SS355 |
| 6605 | 4822 130 83649 | 1SS355 |

| | | |
|---|---|---|
| 7022 | 3198 010 42310 | BC847BW |
| 7053 | 9340 425 20115 | BC847BS |
| 7063 | 3198 010 42310 | BC847BW |
| 7064 | 9352 640 96557 | SAA5565 |
| 7064 | 9352 641 92557 | SAA5667 |
| 7066 | 4822 209 17377 | M24C32-WMN6 |
| 7070 | 9322 143 59671 | UPD431000AGU |
| 7301 | 9352 626 19557 | TDA 8885 QFP-64 |
| 7305 | 3198 010 42310 | BC847BW |
| 7307 | 3198 010 42310 | BC847BW |
| 7331 | 5322 130 42756 | BC857C |
| 7368 | 3198 010 42310 | BC847BW |
| 7401 | 9351 869 40118 | 74HC4053PW |
| 7402 | 3198 010 42310 | BC847BW |
| 7403 | 9352 632 26118 | TDA9171T/N1 |
| 7405 | 9352 630 99118 | TDA9181 |
| 7412 | 9340 425 20115 | BC847BS |
| 7413 | 3198 010 42310 | BC847BW |
| 7421 | 3198 010 42310 | BC847BW |
| 7442 | 3198 010 42310 | BC847BW |
| 7443 | 3198 010 42310 | BC847BW |
| 7444 | 4822 130 60383 | BF824 |
| 7445 | 5322 130 42718 | BFS20 |
| 7630 | 9351 874 90118 | 74HC4052PW |
| 7645 | 9340 425 20115 | BC847BS |
| 7650 | 9351 869 40118 | 74HC4053PW |
| 7651 | 9322 143 53671 | MSP3415D |
| 7651 | 9322 149 63671 | MSP3451G |

## SIDE I/O [D]

### Various

| | | |
|---|---|---|
| 0240 | 2422 025 12485 | Conn 11P |
| 1254 | 4822 267 31014 | HEADPHONE SOCKET |
| 1255 | 4822 265 11606 | Conn 3P |

| | | |
|---|---|---|
| 2286 | 4822 122 33642 | 150pF 5% 50V |
| 2288 | 4822 122 33642 | 150pF 5% 50V |
| 2292 | 5322 122 32311 | 470pF 10% 100V |
| 2294 | 5322 122 32311 | 470pF 10% 100V |
| 2296 | 4822 122 30043 | 10nF 80% 63V |
| 2297 | 4822 122 30043 | 10nF 80% 63V |

| | | |
|---|---|---|
| 3285 | 4822 116 52201 | 75Ω 5% 0.5W |
| 3286 | 4822 116 52176 | 10Ω 5% 0.5W |
| 3287 | 4822 116 52201 | 75Ω 5% 0.5W |
| 3288 | 4822 116 52176 | 10Ω 5% 0.5W |
| 3289 | 4822 116 52249 | 1k8 5% 0.5W |
| 3291 | 4822 050 11002 | 1k 1% 0.4W |
| 3292 | 4822 117 10834 | 47k 1% 0.1W |
| 3293 | 4822 050 11002 | 1k 1% 0.4W |
| 3294 | 4822 117 10834 | 47k 1% 0.1W |
| 3295 | 4822 116 52276 | 3k9 5% 0.5W |
| 3296 | 4822 117 10833 | 10k 1% 0.1W |
| 3297 | 4822 117 10833 | 10k 1% 0.1W |

| | | |
|---|---|---|
| 6291 | 9340 548 61115 | PDZ12B |
| 6292 | 9340 548 61115 | PDZ12B |
| 6293 | 9340 548 61115 | PDZ12B |
| 6294 | 9340 548 61115 | PDZ12B |

## TOP-CTRL [E]

### Various

| | | |
|---|---|---|
| 0027▲ | 3139 124 30381 | TOP CONTROL BRACKET |
| 0080▲ | 3139 137 52451 | TOP CONTROL ASSY |
| 0080 | 3139 137 66921 | TOP CONTROL BUTTON |
| 0215 | 4822 267 10748 | Conn 3P |
| 1091 | 4822 276 13775 | SWITCH |
| 1092 | 4822 276 13775 | SWITCH |
| 1093 | 4822 276 13775 | SWITCH |
| 1094 | 4822 276 13775 | SWITCH |

| | | |
|---|---|---|
| 3091 | 4822 051 20561 | 560Ω 5% 0.1W |
| 3092 | 4822 051 20391 | 390Ω 5% 0.1W |
| 3093 | 4822 051 20561 | 560Ω 5% 0.1W |
| 3094 | 4822 117 11504 | 270Ω 1% 0.1W |
| 3095 | 4822 051 20332 | 3k3 5% 0.1W |
| 3096 | 4822 117 11139 | 1k5 1% 0.1W |

| | | |
|---|---|---|
| 6091 | 4822 130 31983 | BAT85 |

## MAINS-_SW [J]

### Various

| | | |
|---|---|---|
| 0132▲ | 4822 276 14024 | Mains switch |
| 0214 | 2422 025 06353 | Conn 5P |
| 1002 | 9322 127 54667 | RC5 rec. TSOP1836UH1 |
| 1008▲ | 9322 050 99682 | LED LTL-10224WHCR |

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|---|---|---|
| 2001 | 4822 124 40207 | 100µF 20% 25V |

| | | |
|---|---|---|
| 3003 | 4822 116 52219 | 330Ω 5% 0.5W |
| 3004 | 4822 116 83872 | 220Ω 5% 0.5W |
| 3008 | 4822 053 21475 | 4M7 5% 0.5W |
| 3009 | 4822 053 21225 | 2M2 5% 0.5W |